

# Closure Report

*Temporary Accumulation Area 765*

*Marine Corps Air Station*

*El Toro, California*

*SWDIV Contract No. N68711-93-D-1459, Delivery Order No. 0070*

*OHM Project No. 18609*

*Document Control No. SW5246*

*Revision 0*

*July 21, 1998*



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## OHM TRANSMITTAL/DELIVERABLE RECEIPT

CONTRACT N68711-93-D-1459

DOCUMENT CONTROL NO: SW5246

TO: Contracting Officer  
Naval Facilities Engineering Command  
Southwest Division  
Mr. Dave Jespersen, Code 57CS1.DJ  
Building 131  
1220 Pacific Highway  
San Diego, California 92132-5101

Date: 22-Jul-98

D.O.: 70

Location: MCAS EL TORO

FROM:

  
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DESCRIPTION Closure Report, Temporary Accumulation Area 765, July 21, 1998  
OF  
ENCLOSURE:

TYPE: Contract Deliverable ( ) D. O. Deliverable (X) Request for Change ( ) Other ( )  
(S) (Tech)

VERSION: N/A

REVISION 0

ADMIN RECORD: Yes ( ) No (X) Category ( ) Confidential ( )

SCHEDULED DELIVERY DATE: 22-Jul-98 ACTUAL DELIVERY DATE: 22-Jul-98

NUMBER OF COPIES SUBMITTED TO THE NAVY: 1/O, 3/C, 3/E  
[AS REQUIRED/DIRECTED BY THE (SOW)]

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# *Acronyms and Abbreviations*

%D	percent difference
µg/kg	micrograms per kilogram
BEHP	bis (2-ethylhexyl) phthalate
bgs	below ground surface
BNI	Bechtel National Inc.
BRAC	Base Realignment and Closure
CA LUFT	California Leaking Underground Fuel Tank
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CQC	Contractor Quality Control
CTF	central treatment facility
DO	delivery order
DTSC	Department of Toxic Substances Control
EPA	United States Environmental Protection Agency
HSO	Health and Safety Officer
HSP	Health and Safety Plan
IRP	Installation Restoration Program
JEG	Jacobs Engineering Group Inc.
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LDC	Laboratory Data Consultants
m/z	mass-to-charge
MCAS	Marine Corps Air Station
MDL	method detection limit
mg/kg	milligram per kilogram
MS	matrix spike
MSD	matrix spike duplicate
OHM	OHM Remediation Services Corp.
OU	Operable Unit
PAH	polynuclear aromatic hydrocarbon
PPE	personal protective equipment
PRG	Preliminary Remediation Goal
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RDL	reporting detection limit
RFA	RCRA Facility Agreement
RI	Remedial Investigation
ROD	Record of Decision
RPD	relative percent difference
RRF	relative response factor
RWQCB	Regional Water Quality Control Board
SIM	selected ion monitoring

## *Acronyms and Abbreviations (Cont)*

SVOC	semi-volatile organic compound
SWDIV	Southwest Division Naval Facilities Engineering Command
SWMU	Solid Waste Management Unit
TAA	temporary accumulation area
TAL	target analyte list
TF	Tank Farm
THM	trihalomethane
TPH	total petroleum hydrocarbons
VOA	volatile organic analysis
VOC	volatile organic compound
VSI	Visual Site Inspection

# ***Section 1***

## ***Introduction***

This Closure Report summarizes the decontamination and sampling activities performed at the Temporary Accumulation Area (TAA) 765 Site at the Marine Corps Air Station (MCAS) in El Toro (hereinafter referred to as the "Station"), California. The work was performed by OHM Remediation Services Corp. (OHM) for the Southwest Division Naval Facilities Engineering Command (SWDIV) under Remedial Action Contract No. N68711-93-D-1459, Delivery Order (DO) 0070.

Decontamination and sampling activities were conducted in accordance with the Navy, Station, and Department of Toxic Substance Control (DTSC) approved Draft Supplemental Work Plan, Closure of Various Temporary Accumulation Areas and RCRA Facility Assessment Sites at the Marine Corps Air Station El Toro, California (OHM, 1997).

### ***1.1 Site Location***

The Station is located approximately 45 miles southeast of the city of Los Angeles in Orange County, California, 1 mile north of the intersection of Interstate 5 (Santa Ana) and Interstate 405 (San Diego) freeways. The Station covers approximately 4,738 acres. Approximately 800 acres of the Station property are currently designated for agricultural outlease. Agricultural outleased lands are located at the corners of the Station, and are used for plant nursery and crop production (MCAS El Toro, 1997). The location of the Station is shown in Figure 1-1, Facility Location Map.

TAA 765 site is located in the northwest quadrant of the Station in the vicinity of the Command Air Museum (Figure 1-2, Location Map). The site consists of a drum storage area located next to Building 765. The TAA 765 facility is a bermed concrete pad, approximately 20 feet long and 10 feet wide, unfenced, with a metal roof for weather protection. A blind sump (i.e., no drain at the bottom) is located in one corner of the pad. The area was used for the storage of hazardous materials and/or wastes in drums on pallets and within storage cabinets. The storage area was in active use through November 1995.

The depth to groundwater in the vicinity of TAA 765 was based on the available water level data collected from groundwater monitoring well 13\_DBMW49. The location of this well is shown in Figure 1-2. Based on this data, the depth to the groundwater at TAA 765 site is approximately 129 feet below ground surface (bgs) (Camp, Dresser, & McKee, Inc. Federal Programs Corporation, 1997).

## 1.2 Project Objectives

The objectives of this project were the following:

- Verify that all stored hazardous wastes, residues, and constituents which may pose a potential health risk have been removed from the TAA 765 site in accordance with the MCAS El Toro Detailed Plan (OHM, 1995).
- Perform verification soil and rinsate water sampling and analysis to obtain "closure status" of the TAA 765 site.

Based on a classification in the Draft Supplemental Work Plan, the TAA 765 site was considered a Type 1 facility (i.e. a bermed TAA with a spill containment sump). Project operations at Type 1 facilities were defined as cleaning the interior portion of the bermed structure unless evidence of spillage, such as staining due to overflow of the berm, was observed. In such a case, the paved area outside the bermed structure would also be cleaned, as necessary, after visual inspection (OHM, 1997).

## 1.3 Regulatory Background and Cleanup Goals

The closure of the TAA 765 site is completed in accordance with the appropriate Federal and State requirements. The TAA 765 site is characterized as "*hazardous waste accumulation areas*" according to the Code of Federal Regulations (CFR), Title 40, Part 262.34 and the California Code of Regulations (CCR), Title 22, Section 66262.34. Because hazardous wastes have been stored at the site, closure of the TAA 765 site is also subject to Federal and State regulations for closure of less than 90 days hazardous waste management facilities (CFR 40, part 264, Subpart G; and CCR 22, Section 66264, Article 7, respectively). The cleanup goals established for the TAA 765 site are based on the following:

### Soil

- United States Environmental Protection Agency (EPA) Region IX Preliminary Remediation Goals (PRGs) dated August 1996 for industrial land use for organic contaminants
- background concentrations for metals contaminants (Bechtel National Inc. [BNI], 1996b)
- 5,000 milligrams per kilogram (mg/kg) concentration limit for total petroleum hydrocarbons (TPH)-purgeable
- 10,000 mg/kg concentration limit for TPH-extractable

### Rinse Water

Prior to decontaminating the TAA 765 concrete pad, the source water used for washing (i.e., fire hydrant water), was sampled and analyzed for organic and inorganic constituents. The analytical result of source water was used as base levels for comparison with the rinse water

samples collected after decontamination. If the rinse water concentrations exceed the base levels by more than 10 percent, the concrete pad would be decontaminated again and resampled. If needed, this procedure would be repeated until the concentrations of the chemicals of concern were within the acceptable ranges as defined.

## ***1.4 Project Scope of Work***

The Scope of Work at the TAA 765 site consists of the following tasks:

- decontamination of concrete floors, berms, and sumps using dry vacuuming, scrubbing, pressure washing, and other applicable techniques
- collection and laboratory analysis of confirmation samples, including soil samples obtained from beneath and adjacent to the TAA structure, and rinsate water samples
- turning over salvageable and recyclable materials to the Station's Defense Reutilization and Marketing Office for recycling
- disposal of water and solid wastes generated during decontamination activities
- preparation of a Closure Report to describe and document the work performed

## ***Section 2***

# ***Previous Investigations and Site Background***

The following section summarizes results from previous investigations at the TAA 765 site and background history of the TAA 765 area. Background information regarding TAA 765 site was obtained from the following documents:

1. *Final RCRA Facility Assessment Report, Marine Corps Air Station El Toro, California (Jacobs Engineering Group Inc., [JEG] 1993)*
2. *Final Addendum RCRA Facility Assessment Report, Marine Corps Air Station El Toro, California (BNI, 1996a)*
3. *Draft Final Phase II, Remedial Investigation Report, Attachment H, OU-3A Site 13, Oil Change Area, Marine Corps Air Station, El Toro, California CTO-0079/0364 (BNI, 1997)*
4. *Final Base Realignment and Closure Cleanup Plan, March 1997, Marine Corps Air Station El Toro, California (MCAS El Toro, 1997)*

## ***2.1 RCRA Facility Assessment***

In 1991, JEG, as part of the Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA), performed the initial Preliminary Review and a Visual Site Inspection (VSI) of the 307 Solid Waste Management Units (SWMUs) within the Station. JEG also conducted a site visit to observe the current conditions of the SWMUs and/or TAA sites, and performed limited sampling. JEG identified a drum storage area near Building 242 as SWMU 67; and a drum storage area near Building 765 as SWMU 266. No sampling visit was performed by JEG for both the SWMUs 67 and 266 sites.

After review of the JEG RFA report, DTSC requested additional information about the TAAs to determine the closure requirements. BNI performed the visual assessment of 73 TAA sites to provide more specific information for a closure strategy for the TAAs. BNI identified SWMU 266, a drum storage area within Site 13 boundary as TAA 765. A copy of the TAA 765 site VSI evaluation form from the BNI Final RFA Addendum report is included in Appendix A, VSI Evaluation Report for TAA 765.

OHM conducted an initial site visit on September 30, 1997 to confirm the location and condition of the TAAs and SWMUs. During the site visit, OHM inspected the locations of SWMUs associated with Building 765. The RFA (BNI, 1996a) identified three SWMUs within the Site 13 boundaries: SWMU 67 (Drum Storage Area); SWMU 217 (Underground Storage Tank); and SWMU 218 (Oil Water Separator). Per JEG RFA report, SWMU 67 was identified as a drum storage area near Building 242. OHM inspected Building 242 vicinity to locate any drum storage area, and found that there was no indication or record of any drum storage area ever existed at Building 242.

Based on a review of the BNI RFA Addendum report and the site visit, it was clear that SWMU 67 and SWMU 266 are actually the same drum storage area. One drum storage area was mistakenly identified twice, as SWMU 67 and SWMU 266. Therefore, the drum storage area near Building 765 is SWMU 266 (TAA 765). A copy of the JEG RFA report table is included as Appendix B, RFA Background Information.

## ***2.2 Remedial Investigation***

TAA 765 is located within the site boundary of Installation Restoration Program (IRP) Site 13, the former Oil Change Area. IRP Site 13 encompasses about  $\frac{3}{4}$  of an acre north of Building 242 in the northwest quadrant of the Station. Site 13 is bounded on the north by former Tank Farm 2 and by a storage yard for Building 242 to the south. Figure 2-1, Vicinity Map – TAA 765 and Site 13, shows the locations of the Site 13 boundary, TAA 765 and Tank Farm 2.

Site 13 consists of two units: Unit 1, the area southeast of Tank Farm 2 (approximately 17,300 square feet); and Unit 2, the area southwest of Tank Farm 2 (approximately 16,800 square feet) (BNI, 1997). JEG and BNI, respectively, completed the Phase I and Phase II Remedial Investigations (RI) for IRP Site 13 under Comprehensive Environmental Response Compensation and Liability Act (CERCLA) program.

Historical aerial photographs were reviewed; and air, soil, soil-gas, and groundwater samples were collected and analyzed during the RI field activities. Also, a fate and transport conceptual model was developed and human health risk assessment was conducted for Site 13. Chemical compounds detected in the soil samples during RI field activities at Site 13 included volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and metals above MCAS El Toro established background levels (BNI, 1997). A copy of the Site 13 portion of the BNI, Draft Final Phase II RI Report for Site 13 is included as Appendix C.

Based on the review of the Phase I, RI field investigation data, and a thorough assessment of potential human health risk at Site 13, a "No Action" Record Of Decision (ROD) was issued for Site 13 with other Operable Unit (OU) 3A sites. The Site 13 ROD was signed on September 30, 1997 by the Base Realignment and Closure (BRAC) Environmental Coordinator, DTSC, Regional Water Quality Control Board (RWQCB) Santa Ana region, and the EPA, Region IX. A copy of the Site 13 ROD is included as Appendix D.

## ***2.3 Former Tank Farm 2 Investigation***

Former Tank Farm 2 (TF-2) is located approximately 20 feet north of the TAA 765 site. Toxguard Systems Inc, removed eight underground storage tanks (USTs) and associated piping in 1995. OHM performed limited subsurface site assessment activities at TF-2 in April 1996. OHM operated a soil vapor extraction system to remove petroleum hydrocarbon contaminants from the vadose zone soil at TF-2 for a period of 1 year from October 1996 to



November 1997. OHM submitted a Draft Site Assessment and Remedial Action report for closure of vadose zone soil at TF-2 in April 1998 (OHM, 1998) to the California RWQCB.

## ***Section 3***

### ***Field Activities***

The following subsections describe the activities that were performed at the TAA 765 site. Field activities were conducted in accordance with the approved *Draft Supplemental Work Plan* (OHM, 1997).

Field activities conducted at the TAA 765 site included a site inspection, pre-construction meeting, a geophysical survey, site decontamination, confirmation soil sampling, rinsate sampling, and waste management.

#### ***3.1 Preparatory Work***

OHM performed a site visit at TAA 765 on October 14, 1997 prior to performing any field activities. A copy of the Site Assessment Log is included in Appendix E, Site Assessment Log.

OHM subcontractor, Geovision, conducted a geophysical survey in September 1997 to identify and locate buried utilities, pipes, and other subsurface anomalies in the vicinity of the TAA 765 site. OHM also notified Underground Service Alert of the intent to hand auger 5 locations up to 4 feet bgs. A copy of geophysical survey report is included in Appendix F, Geophysical Survey Data.

OHM, in coordination with the Station's Resident Officer in Charge of Construction, conducted a pre-construction meeting. The meeting addressed the Station's regulations for contractors, the construction schedule, health and safety coordination, construction quality control, and tenant notifications.

#### ***3.2 Site Decontamination***

Decontamination activities at TAA 765 began on October 20, 1997 and included: site preparation; and berm, sump, and floor decontamination as specified in the Supplemental Work Plan (OHM, 1997).

The following construction management activities were implemented at the TAA 765 site:

- OHM notified building tenants of the decontamination area.
- OHM Health and Safety Officer (HSO) implemented site security, health and safety procedures, and dust control activities. The work area was divided into: exclusion or hot zone; a contamination reduction zone; and a support zone. The OHM Project Engineer performed a visual inspection for evidence of contamination inside and adjacent to the TAA 765 site.

- OHM field crew prepared the TAA for decontamination. Preparation included initial scraping, vacuuming, and sweeping.

The following decontamination methods were selected to minimize the generation of air emissions and the quantity of decontamination water. The decontamination methods included the following:

- vacuuming of solid materials from floor and sump
- mechanical scrubbing of floor and hand scrubbing of berms
- cold-pressure washing

Vacuuming techniques included the physical removal of dust and other solid dirt particles from the pad surface. Dust and other dirt particles collected as a result of this activity were placed in a 55-gallon steel drum for later disposal. Vacuuming was performed using high-efficiency particle filter vacuums. Visible stains on the berms and floor were wire-brushed or scraped to remove loose particles and stained coatings.

A pressure washer was used to wash down the berms and floor of TAA 765. After completion of two wash cycles, the sump was rinsed and pumped out, then a third and final rinse of the pad was performed in a similar manner as described above. After the third rinse, rinse water was allowed to collect in the sump and then a plastic sample bottle was immersed in the sump to collect the rinse water sample.

Decontamination wastewater was then collected from the sump using a trailer-mounted portable skid unit (equipped with vacuum pump and 1,500-gallon steel storage tank). Wastewater was then transferred to the 2,500-gallon polyethylene storage tank located at the Station's central treatment facility (CTF) compound.

### ***3.3 Confirmation Soil Sampling***

Confirmation soil samples were collected from four locations around the TAA 765 site; and one location beneath the bottom of the sump, to verify if any spillage occurred during handling of hazardous material drums. Soil sample locations were selected based on visual inspection performed during site visit on October 14, 1997. A total of 10 soil samples were collected from 5 hand auger borings (SB-A, SB-B, SB-C, SB-D, and SB-E) at the TAA 765 site.

Soil samples were collected in standard stainless steel sleeves at two depths; 18 inches and 36 inches bgs. Details on the sampling strategy and analytical methods are discussed in Section 4 (Sampling and Analysis). The locations of the hand auger borings are shown on Figure 3-1, Site Plan.

### ***3.4 Equipment Decontamination***

Equipment used in the exclusion zone was decontaminated prior to removal from the site, as identified in the site specific Health and Safety Plan (HSP). Decontamination procedures varied according to the type of equipment involved. The wet/dry vacuum and pressure washer were washed with clean water and/or flushed with clean water to remove any contaminants prior to removal. Equipment was triple rinsed to ensure decontamination and prevent cross-contamination. Hand-held equipment such as brooms, squeegees, and brushes, were also washed prior to removal from the exclusion zone.

The equipment used for collecting soil samples was decontaminated between each use. The hand auger assembly was washed in a typical three step procedure consisting of: decontaminating the equipment first using a brush in a bucket of Alconox detergent and water; then a second bucket of water for immediate rinse; and again in a third bucket of water for the final rinse. The hand auger assembly was decontaminated between each sample collection.

### ***3.5 Site Health and Safety***

Health and safety measures during field activities followed the site HSP. Daily tailgate meetings were held each workday by the OHM HSO. The use of proper personal protective equipment (PPE) was monitored by the HSO. The site was segregated into work zones using caution tape and stakes. Movement of personnel and equipment between the zones was conducted in accordance with the decontamination measures for the zones.

Dust levels were monitored using a Mini-Ram dust monitor. No concentrations of dust above background levels were detected.

### ***3.6 Field Quality Control Activities***

Quality control (QC) of field operations were ensured by adherence to the Contractor Quality Control Plan (CQC) Addendum (OHM, 1997) and OHM Corporate Quality Assurance (QA) policies. A Field/CQC Engineer was present during decontamination and sampling activities. QC activities included field inspections, field quality control sampling, and project documentation.

During decontamination activities, the OHM CQC engineer performed visual inspections to verify the area was properly decontaminated, and the appropriate samples were collected to support the decontamination work. CQC Reports, which included preparatory, initial, and follow-up inspections, were completed on a daily basis. A sample log was prepared and updated on a daily basis to ensure that all sampling efforts were performed as specified in the plans.

### ***3.7 Land Surveying***

After completing the confirmation soil sampling, the soil boring locations were surveyed by Cal Vada Surveying Inc., a California-registered land surveyor. The surveyed locations were measured to  $\pm 0.01$  feet horizontally and tied to the California State Plane Coordinate Systems, North American Datum 1983. The surveyed elevations were measured to  $\pm 0.01$  feet vertically and tied to mean sea level elevation. The land surveying data for TAA 765 site are presented as Appendix G, Land Survey Data.

### ***3.8 Waste Management***

Waste generated during the decontamination activities at the TAA 765 site included the following:

- one bag (55-gallon drum liners) of PPE
- 0.05 cubic yards of sump and floor debris (e.g., rocks, rust, solid soils, etc)
- approximately 80 gallons of decontamination wash water stored on-site at the CTF in a closed-top polyethylene storage tank, specifically marked "TAA Water".

All generated wastes have been disposed of in accordance with applicable State and Federal regulations. Based on the results and review of analytical data, OHM disposed of the wastes as follows:

- Bags of PPE were disposed off-site at Bowerman Canyon non-hazardous Class III landfill, based on the results of the sump/floor debris samples.
- 0.05 cubic yards of floor debris, disposed off-site at Bowerman Canyon non-hazardous Class III landfill, based on the analytical results.

Wastewater generated from decontamination activities was treated through the Station's CERCLA Carbon Adsorption Treatment System (operated and maintained by OHM ) located at the CTF, following the determination that the constituents were within the normal range for treatment. Treated effluent water was sampled and based on the review of the analytical results, it transferred to the Station's Golf Course holding tank for reuse. A copy of the analytical result of the treated water is included in Appendix H, Laboratory Analytical Results for TAA Effluent Treated Water.

## ***Section 4***

### ***Sampling and Analysis***

The objective of the sampling and analysis is to provide analytical data to document the successful decontamination of TAA 765 site and to characterize the soil conditions adjacent to and beneath the TAAs. The sampling methodology, analytical methods, analytical results and interpretation of confirmation soil sampling have been in accordance with the analytical strategy presented in the Draft Supplemental Work Plan (OHM, 1997) and is described in the following text.

The laboratory analyses were performed based on EPA Solid Waste-846 (Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, June, 1997) and California Leaking Underground Fuel Tank (CA LUFT) Manual (State Water Resources Control Board, 1989). The test methods used for analyses were selected on the basis of their ability to detect the chemicals of potential concern with suitable detection limits to verify the successful decontamination of TAA 765 site, and to prove that there is no risk to human health and the environment.

All samples were analyzed by VOC Analytical Laboratory, a state of California certified and Naval Facilities Engineering Services Center-approved analytical laboratory.

#### ***4.1 Field Sampling Summary***

The sampling strategy for TAA 765 focused on two aspects of the site: possible releases on the surface of the TAA; or possible releases into the soil surrounding the TAA. Soil samples were collected and analyzed for constituents contained in the wastes that may have been stored at the TAA 765 area. Samples collected from large porous (concrete) surfaces using wipe techniques were not considered to be representative by the DTSC. Therefore, samples of the rinsate were collected to provide an indicator of the effectiveness of the decontamination. Rinsate samples were collected to determine the concentrations of any chemicals that might be present in any washwater coming in contact with the floors and sump following the washing process.

Sample points were selected based on the visual inspection performed during a site visit. Sample collection points included any areas where there was evidence of spills, contamination of concrete, or visual signs of secondary containment structure deterioration (cracks in berms). However, no cracks or visual indications of spills were observed at TAA 765. Soil samples were collected from the immediate area of the TAA; one auger boring was hand-augered at each side of the TAA. One soil sample was collected from underneath the concrete sump to verify that chemicals did not penetrate the concrete.

The fire hydrant located within the OHM trailer compound was used as the source for water used for washing and rinsing the TAA concrete floor. The rinsate from the third rinse of the floor surface was collected in the sump and submitted to the laboratory for analysis.

Following the completion of the floor decontamination, a soil sample was collected underneath the sump. A concrete coring machine was used to open a 6-inch-diameter hole in the concrete, then a hand auger was used to bore into the soil under the concrete to approximately 18 inches. An undisturbed soil sample was collected at approximately 18 inches and then 36 inches bgs using a hammer-driven brass tube.

Following the collection of the soil samples, the excess soil was placed back in the open borehole (no VOCs were identified by the photoionization detector). Concrete (redimix) was poured into the open hole in the bottom of the sump to seal the opening. The surface of the concrete was then finished with a trowel to match the existing surface. The sample collection summary log is presented in Table 4-1, Sample Collection Summary Log.

Quality assurance/quality control (QA/QC) samples were collected as follows:

- Equipment rinsate samples were collected at a frequency of 1 per day.
- Duplicate samples were collected at a frequency of 1 per 10 samples.
- Trip blank samples were collected at a frequency of 1 per sample cooler for coolers containing samples for VOC analyses.
- Laboratory duplicate sample analysis was performed at a frequency of 1 per 10 samples or per batch.
- Laboratory matrix spike/spike duplicate sample analysis was performed at a frequency of 1 per 20 samples or per batch.
- Laboratory reagent blank analysis was performed at a frequency of 1 per 20 samples or per batch.

Equipment rinsate samples were collected and analyzed to identify the occurrence of any cross-contamination during the sampling process. These samples consist of deionized water poured through the non-dedicated sampling equipment after decontamination and returned to the contract laboratory for analysis. Rinsate blanks were analyzed for the same parameters as the field samples. Equipment rinsate blanks were collected at a rate of 1 for each sampling day.

Duplicate sampling was performed to assess the consistency of the sampling program and precision of the contract laboratory. The duplicate samples were collected as closely as practical to the original sample from the same location and depth at the same time. For soil samples, the laboratory was instructed to provide results for the blind duplicate samples.

Trip blanks were used to determine whether samples were contaminated during transit or sample collection. Trip blanks pertain only to volatile organic analysis (VOA). Trip blanks were composed of analyte-free water added to a clean VOA vial. The trip blank accompanied sample containers, such as coolers, from the laboratory to the field and back again to the laboratory. Trip blanks were prepared by the contract laboratory and accompanied every cooler containing VOA sample types.

The purpose of the matrix spike analysis was to determine the appropriateness of the method with respect to the type of sample matrix by measuring percent recovery. The matrix spike consists of an aliquot of a matrix (water or soil) spiked with known quantities of compounds and subjected to the entire analytical procedure.

The purpose of the matrix spike duplicate was to determine the precision of the method. A second aliquot of the same matrix as the matrix spike is spiked, and analyzed in the same manner as the matrix spike sample.

The purpose of the reagent blank analysis was to determine if any contamination is introduced by laboratory reagents or handling. The reagent blank consists of either analyte free water or sand which is processed and analyzed in the same manner as a typical sample.

## ***4.2 Analytical Methods***

Analytical methods were selected to encompass all the chemicals of potential concern at the TAA 765 site. The following methods were performed to characterize samples collected from the TAA 765 site:

- percent Moisture by American Society for Testing Materials Method D2216
- total Cyanide by EPA Method 9010A
- pH by EPA Method 9045
- metals by EPA Methods 6010A and 7000 Series
- SVOCs by EPA Method 8270A and 8270B
- organochlorine pesticides and polychlorinated biphenyls by EPA Method 8081
- extractable TPH by EPA Method 8015 (CA LUFT modified)
- purgeable TPH by EPA Method 8015 (CA LUFT modified)
- VOCs by EPA Method 8260A

Also for analysis at the TAA 765 site, the Selected Ion Monitoring (SIM) technique was used on the following four semi-volatile organic compounds in order to achieve detection limits lower than the Region IX PRGs:

- benzo(a)pyrene
- dibenzo(a,h)anthracene
- n-nitrosodi-n-propylamine
- bis(2-chloroethyl)ether



SIM is a recognized gas chromatograph/mass spectrometer technique used to lower detection limits for organic compounds. As specified in EPA Method 8270B, semi-volatile compounds are introduced into the gas chromatograph by direct injection. The components of the sample are separated by the gas chromatograph and detected by the mass spectrometer, which provides both qualitative and quantitative information.

For each component or compound separated by the gas chromatograph, the mass spectrometer produces a characteristic mass spectrum. The mass spectrometer ionizes the sample molecules and separates any resulting fragments by mass-to-charge ( $m/z$ ) ratios. The fragmentation pattern is used to determine the structure of the original molecule. The intensity of one or more of the fragments is used to quantitate the identified compound.

Upon identification of a target compound by comparison of the acquired mass spectrum with the mass spectrum of a standard, EPA Method 8270B specifies a fragment or characteristic ion to use for quantitation of the analyte. Method 8270B requires that the mass spectrometer scan from 35 to 500 amu ( $m/z$ ) every 1-second or less. In SIM, the entire mass range is not scanned. Typically, only a few  $m/z$  are monitored. As a result, the mass spectrometer is able to collect more data from a specific  $m/z$ , resulting in an improved signal-to-noise ratio, which in turn improves detection limits. There is, however, a practical limitation to the number of  $m/z$  that can be monitored at one time so that the total scan time does not exceed 1 second. As a result, the number of compounds that can be measured in a single SIM analysis is limited.

### ***4.3 Laboratory Analytical Results***

This section provides summary and assessment of the analytical results of sampling performed at TAA 765 site. VOC Analytical Laboratory in Glendale, California analyzed all the soil and rinsate water samples. Soil and rinsate water sample analytical results with comparison with background concentration and PRG are presented in Table 4-2, Confirmation Soil Sample Analytical Results - TAA Site 765; and Table 4-3, Water and Decontamination Sample Analytical Results - TAA Site 765, respectively. The detailed hard copy of analytical results obtained from VOC Analytical Services is included in Appendix I, Laboratory Analytical Results.

#### ***4.3.1 Soil Sample Analytical Results***

**Volatile Organic Compounds (VOCs)** — No VOCs were detected above the laboratory reporting limits in all 10 confirmation soil samples collected at TAA 765 site. Three VOCs: 2-butanone; acetone; and toluene, were detected in shallow soil samples above the laboratory reporting limits at Site 13 during Phase I RI sampling (BNI, 1997).

**Semi-Volatile Organic Compounds (SVOCs)** — No SVOCs were detected above the laboratory reporting limits in six soil samples collected from TAA Site 765. However, the laboratory diluted the sample 10 times because of a matrix interference (TPH-extractable concentration in the sample at 530 mg/kg) resulting in elevated reporting limits. The laboratory attempted a reanalysis at a 5 times dilution, but was unable to recover the method

surrogates at this concentration. As a result, the reporting limits for six SVOCs exceeded the respective PRGs.

Upon further discussion with the laboratory, the method detection limits (MDLs) for three of the SVOCs were determined to be substantially lower than the respective PRGs, and the analytes could be reliably considered not detected at the MDL. The three compounds were:

- benzo (a) anthracene (conventional 8270B)
- benzo (b) fluoranthene (conventional 8270B)
- bis (2-chloroethyl) ether (SIM 8270B)

These results are flagged in Table 4-2.

In order for the reporting limits meet the PRGs, the remaining three SVOCs were measured by SIM (in addition to the compounds listed in Section 4.2):

- hexachlorobenzene
- indeno(1,2,3-c,d)pyrene
- pentachlorophenol

The OHM criteria for acceptance of this SIM data was that the laboratory MDL must be equal or less than half the PRG. In summary, no SVOCs were detected in the sample above the EPA Region IX PRGs. Additionally, to further establish the absence of any SVOC contamination at TAA 765, sample 18609-710, collected from TAA765-SBA at 36 inches bgs was analyzed for SVOCs; no compounds were detected above the laboratory reporting limits.

SVOCs and polynuclear aromatic compounds (PAHs) were reported in subsurface soil in Phase I RI sampling locations at Site 13. All SVOCs and PAH concentrations were between 140 and 300 micrograms per kilograms ( $\mu\text{g}/\text{kg}$ ) (BNI, 1997). Please refer to Appendix C for details on the list of analytes.

**Total Petroleum Hydrocarbons (TPH)** — TPH as diesel was reported at 530 mg/kg in only one sample (18609-709 at 1.5 feet bgs) at TAA 765 site. TPH as diesel, TPH as gasoline, and Jet Propellant Type 5 were not detected above the laboratory reporting limits in the remaining five samples.

TPH as diesel (highest concentration 490 mg/kg), TPH as gasoline (highest concentration 0.319 mg/kg), and total recoverable petroleum hydrocarbons (highest concentration of 3,340 mg/kg) were reported in the surface soil of Site 13 during Phase I, RI field sampling (BNI, 1997).

**Target Analyte List (TAL) Metals** — The laboratory reporting limits for the following TAL metals at TAA 765 site exceeded the established MCAS El Toro background levels (BNI, 1996b), but none exceeded the PRGs:

Analyte Name	Highest Concentration Detected at Laboratory Reporting Limit (mg/kg)	MCAS El Toro Established Background Concentration (mg/kg)
Antimony	5.7 U	4.5
Silver	1.1 U	0.65
Thallium	5.7 U	0.53
Selenium	0.57 U	0.37

*Explanation:*

*mg/kg – milligrams per kilogram*

*U – Not detected above or equal to the stated reporting limit.*

Twelve TAL metals (aluminum, antimony, barium, beryllium, cobalt, copper, lead, manganese, mercury, nickel, silver, and zinc) were reported above background concentrations in shallow soil at Site 13 during Phase I RI field sampling (BNI, 1997).

**Pesticides** — The laboratory detection limits for the pesticide endosulfan I at TAA 765 site exceeded the established MCAS El Toro background levels (BNI, 1996b). However, the background concentration calculated and reported by BNI is based upon only two positive results and 45 non-detected results. Also, the positive results appear to be estimated results (J-flags missing). The detection limits reported (for the non-detect samples) are in the 1 to 2 µg/kg range; however, the background concentration was calculated and reported to be 0.179 µg/kg. The endosulfan I detection limits reported in this document for TAA 765 are below the PRGs. The laboratory reporting limit for endosulfan sulfate (4.6 U µg/kg) in one sample identified as 18609-709 (TAA765-SBA at 1.5 feet bgs) exceeded the background concentration (4.21 µg/kg) but not the PRG.

**Five pesticides** — endosulfan sulfate (5.77 µg/kg); 4,4'-dichlorodiphenyldichloroethane (DDD) (6.69 µg/kg); 4,4'-dichlorodiphenyltrichloroethane (DDT) (12.5 µg/kg); delta-hexachlorocyclohexane (BHC) (5.03 µg/kg); and endrin ketone (5.2 µg/kg) were reported in the 5-foot bgs sample from well 13\_DBMW49 (BNI, 1997).

In summary, no target analytes were detected above background concentrations at TAA Site 765, with the exception of TPH-extractable compounds. All concentrations of detected analyte are consistent with concentrations detected during the Site 13 Phase I IR field sampling (BNI, 1997).

#### 4.3.2 Rinsate Water Analytical Results

Analytes detected in the TAA 765 Decontamination/Rinse Water are consistent with the analytes present in the source water. Alkali metals, iron, zinc, trihalomethanes (THMs) and

bis (2-ethylhexyl) phthalate (BEHP) are present in both the source and rinse waters. THMs were detected at levels expected in fire hydrant water. BEHP was present in the source and rinse water at comparable levels. Phthalates such as BEHP are used extensively in the plastics manufacturing and are common laboratory contaminants. The levels at which BEHP was detected are consistent with levels introduced by the laboratory or by sampling activities.

Two additional source water samples were collected from the same fire hydrant on different days for use at other TAA field activities (including additional TAAs). Results of these two samples are compared with the TAA 765 source water and with TAA 765 rinsate water analytical data in Table 4-4, Source Water Comparison to TAA Rinse Water.

## ***Section 5***

### ***Data Quality Assessment***

The analytical data generated for the analysis of the samples collected in connection with the assessment of TAA 765 were reviewed and validated with respect to the QA/QC parameters specified in the work plan. The following were evaluated:

- EPA recommended holding times
- cooler condition upon receipt by the laboratory
- initial and continuing calibration standards
- method blanks
- surrogate recoveries
- matrix spike/matrix spike duplicate (MS/MSD) recoveries
- laboratory control samples (LCS) recoveries

#### ***5.1 Soil Samples***

All samples were prepared and analyzed within EPA recommended holding times. The sample cooler was received intact and within the required temperature range of 4+2 degrees Celsius. Any sample results associated with QC parameters that were out of compliance with the Work Plan have been flagged and annotated in Tables 4-2 and 4-3. All data are useable as qualified.

#### ***5.2 Rinsate Water Samples***

All samples were prepared and analyzed within EPA recommended holding times. The sample cooler was received intact and within the required temperature range of 4+2 °C. Any sample results associated with QC parameters that were out of compliance with the Work Plan have been flagged and annotated in Tables 4-2 and 4-3. All data are useable as qualified.

#### ***5.3 Data Validation***

This section addresses the validity and quality of the data collected from TAA 765 site. Analytical data were reviewed and validated in accordance with the EPA *National Functional Guidelines for Organic and Inorganic Data Review* (EPA, 1994). Ninety two percent of the data were subjected to Level III and 8 percent were subjected to Level IV validation. Data validation service was provided by Laboratory Data Consultants (LDC), an

independent data validation company. A hard copy of the LDC report is provided in Appendix J.

Laboratory analytical data were subjected to a four-stage process of evaluation that included: completeness checks; verification of hard copy and electronic results; validation of the data; and final evaluation based on the professional judgment of the project chemist.

The data were qualified by LDC to indicate whether the data has been affected by any deviation from the analytical protocols established in the Draft Supplemental Work Plan (OHM, 1997). Unusable data was qualified with an "R" (rejected). All other results were either unqualified (no flag), nondetected ("U" flag), nondetected with uncertainty in the report detection limits ("UJ" flag), or detected with uncertainty in the reported concentration ("J" flag).

Samples were submitted for chemical analyses as described in Section 3. Analytical services were provided by VOC Analytical Laboratories, Inc. California.

### **5.3.1 Analytical Quality Control Program**

This section provides a description of the field and laboratory QC sample results which were used to evaluate the precision, accuracy, representativeness, completeness, and comparability.

**Precision** — Precision was evaluated based on the QC results submitted from the field and from the laboratory. The calculated relative percent difference (RPD) of MS/MSDs, laboratory control sample/laboratory control sample duplicates (LCS/LCSDs), and the field duplicate pair provided information on the precision of sampling and analytical procedures. RPDs for duplicate samples were not calculable when one or both results were not detected. The precision results for all the samples were within the required limits with the following exceptions:

The RPD for 4-nitrophenol in the LCS/LCSD analysis was above the acceptance limits for the sample number 18609-753. However, since 4-nitrophenol was not detected in the sample, the result was not qualified. The 4-nitrophenol recovery in the LCS was below the project control limit, and the associated sample result for 18609-753 was flagged as estimated.

Percent difference (%D) for 2-hexanone was above the acceptance limit in the continuing calibration; therefore, associated sample numbers 18609-709, 18609-711, 18609-713, 18609-715, and 18609-717 were flagged as estimated. Sample numbers 18609-710, 18609-712, 18609-714, 18609-716, and 18609-178 were also flagged as estimated for 2-chloroethylvinyl ether, methyl isobutyl ketone, and 2-hexanone for the same reason.

Percent difference (%D) for alpha-BHC was above the acceptance limit in both initial and continuing calibrations; therefore, associated sample numbers 18609-709, 18609-711, 18609-713, 18609-715, and 18609-717 were flagged as estimated. The same samples were flagged as estimated for gamma-BHC and delta-BHC for the same reason.

Delta-BHC, dieldrin, methoxychlor, Aroclor-1016, Aroclor- 1260, endrin and gamma-BHC results were flagged as estimated on the sample number 18609-753 because acceptance criteria in either initial or continuing calibrations were not met.

**Accuracy** — Evaluation of the percent recovery of spiked analytes in MS/MSD samples, LCS/LCSDs, and surrogates provide information on accuracy. The accuracy results for all samples were within the required limits with the following exceptions:

- Average relative response factors (RRF) for acetone and vinyl acetate were below the acceptance limits in initial calibration. Therefore, all detected results were flagged as estimated.
- The continuing calibration RRF were below the acceptance limits for chloromethane, acetone, vinyl acetate, methyl ethyl ketone, and methyl isobutyl ketone and associated samples numbers 18609-709, 18609-711, 18609-713, 18609-715, and 18609-717 were estimated. Sample numbers 18609-710, 18609-712, 18609-714, and 18609-716 also were estimated for the compounds, acetone, vinyl acetate, methyl ethyl ketone, methyl isobutyl ketone for the same purpose.
- The RRF for methyl ethyl ketone, methyl isobutyl ketone in both continuing and initial calibrations were below acceptance limits; therefore, they were flagged as estimated for the associated sample numbers 18609-753 and 18609-754.
- The coefficient of determination ( $r^2$ ) was less than 0.990 for Aroclor-1016. The sample numbers affected were 18609-709, 18609-711, 18609-713, 18609-715, and 18609-719; therefore the results were flagged as estimated.
- The  $r^2$  was less than 0.990 for endrin aldehyde. The sample number affected was 18609-753; therefore, the result was flagged as estimated.

**Representativeness** — Representativeness was assessed through the evaluation of method blank and trip blank samples. Target analytes were not detected in the method and trip blank samples with the following exception:

Bis(s-ethylhexyl)phthalate (BEHP) was detected in the method blank, therefore, the detection limit for sample 18609-711 was raised and flagged with "U". Phthalates such as BEHP are used extensively in the plastics and rubber manufacturing industry in such items as the water hose used to transfer water from the water truck to the TAA surface.

**Completeness** — Completeness was evaluated in two criteria. The first criteria was assuring that all analytical requests were met, samples were received in the proper condition, and all analytes were performed within the technical holding times. The second criteria was evaluating the analytical completeness by calculating the percent of acceptable analytes. The completeness parameters are:

- the completeness goal for holding times is 100 percent
- the goal for sample collection and analysis frequency of duplicate and MS/MSD samples was 10 and 5 percent, respectively

- the percent analytical completeness goal was 90 percent

All samples were extracted and analyzed within the appropriate holding times. No duplicate samples were collected. The precision from field duplicates will be used qualitatively to assess the heterogeneity of the soil. The percent analytical completeness goal is based on a project-wide sampling program and cannot be assessed on a site-by-site basis.

**Comparability** — To ensure comparability, sampling was performed using standardized procedure. Laboratory procedures follow EPA analytical methods and the CA LUFT Manual guidelines. All soil samples were reported on a dry weight basis. The data were then evaluated for comparability of reporting detection limits (RDLs) and associated dilution factors. RDLs were elevated when samples required dilution to quantify target compounds within the linear range of the instrument or when there was sample matrix interference.

All reporting limits were achieved for VOCs, TPH-purgeable, TPH-extractable, metals, SVOCs, pesticides, polychlorinated biphenyls, and cyanide by the laboratory.

**Summary** — All data associated with TAA 765 site were usable and acceptable as qualified. Overall precision and accuracy were met. The analytical results and associated qualifiers are summarized in Tables 4-2 and 4-3.



## ***Section 6***

# ***Risk Characterization and Hazard Index Calculation***

This section briefly describes the approach used to estimate risk and summarizes the baseline screening level risk assessment results for the TAA 765 site. A screening level risk assessment for human health was conducted for TAA 765 following the guidance provided in the EPA Region IX PRGs Memorandum (EPA, 1996). The results of confirmation soil sampling conducted after decontamination of the TAA were used to calculate risks.

A complete fate and transport analysis and human-health baseline risk assessment was conducted for IRP Site 13 by BNI as part of the RI and is documented in Draft Final RI report for OU-3A sites (BNI, 1997). Please refer to Appendix C for details.

### ***6.1 Physical Characteristics of the TAA 765 Site***

Based on the review of the RI boring logs, the subsurface lithology at TAA 765 site consists of moderately to well graded clayey to silty sand that is interbedded with sandy silt and clay. These sediments have moderate-to-high porosity and low permeability. The principal aquifer is present at a depth of approximately 130 feet bgs. The regional groundwater flow direction in the area of site is generally to the west-northwest (BNI, 1997).

### ***6.2 Exposure Assessment***

TAA 765 was used as a temporary accumulation area for hazardous waste under an industrial land use exposure scenario. The Station is preparing for closure in July 1999 in accordance with the Base Closure and Realignment Act of 1993 (BRAC III). TAA 765 site is located within an area that has been tentatively identified as part of the terminal complex area according to the El Toro Community Reuse Plan (County of Orange, 1997) as shown in Appendix K, Tentative Reuse Parcel Location of TAA 765. The future land use for the site is expected to remain industrial as part of the terminal complex for the proposed airport facility.

There will be limited exposure to soil because there is a concrete or asphalt surface over most of the site as part of the terminal complex. However, for screening purposes, the ingestion, dermal contact, and inhalation exposure pathways are assumed to be complete. Should the screening fail, further evaluation of the exposure pathways would be required. Figure 6-1, Site Conceptual Model – TAA 765, presents the TAA 765 site conceptual model.

Under an industrial land use scenario at TAA 765, humans (workers) could be potentially exposed to TAA 765 surrounding soil by ingestion, dermal contact, or inhalation of dust. These are the same exposure pathways evaluated by the EPA PRGs (EPA, 1996). Figure 6-2,

Potential Migration Pathways, Exposure Routes and Receptors, presents the potential migration pathways at the TAA 765 site.

### **6.3 Toxicity Assessment**

The PRGs incorporate the toxicity values from the Integrated Risk Information System, the Health Effects Assessment Summary Tables, and the National Center for Environmental Assessment. Cancer PRGs incorporate cancer toxicity values and the noncancer PRGs incorporate the toxicity values for chronic health effects other than cancer (EPA, 1996). Both cancer risk and noncancer hazards were evaluated in this screening risk assessment.

### **6.4 Risk Characterization**

The PRGs are concentrations calculated using standard exposure factors that are protective of humans, including sensitive groups, over a lifetime. These PRG concentrations pose acceptable cancer risk or noncancer hazard under the exposure scenarios evaluated. Generally, a cancer risk of  $10^{-6}$  to  $10^{-4}$  and a noncancer hazard index of 1 or less, are considered acceptable levels of exposure. The PRG concentrations are calculated to at a cancer risk level of  $1 \times 10^{-6}$  and a noncancer hazard index of 1.

Cancer risk is calculated by dividing the site concentration by the PRG for each chemical. The ratios are added and multiplied by  $10^{-6}$ . The hazard index is calculated by dividing the site concentration by the PRG for each chemical and adding the ratios.

Four carcinogens were detected in the soil: arsenic, beryllium, nickel, and bis(2-ethylhexyl)phthalate. The detected concentrations of arsenic, beryllium, and nickel were less than the background concentrations. Bis(2-ethylhexyl)phthalate is a common laboratory contaminant. Thallium was the only noncarcinogen metal detected in soil above background concentrations. However, all detected chemicals were included in the risk screening.

The maximum detected concentrations of all detected chemicals in soil were compared to the industrial cancer and noncancer PRGs, as shown in Table 6-1, Industrial Risk Screening Worksheet for Soil. The background concentrations were also compared to the PRGs. The risk ratios were calculated by dividing the maximum concentration or background concentration by the PRG.

The cancer and noncancer risk ratios for each chemical were summed for the maximum detected concentrations and background concentrations, respectively. The background risk ratio was subtracted from the maximum risk ratio to calculate the site-related risk ratio. If the background concentration was higher than the maximum detected site concentration, the maximum ratio was used as the background ratio. This calculation was performed so the background risk ratio for one chemical would not make the potential risk of another chemical.

The summed cancer risk ratio was multiplied by  $10^{-6}$ , resulting in a site-related risk of  $1.5 \times 10^{-8}$ . The summed noncancer risk ratio resulted in a site-related noncancer hazard index of 0.03, mainly due to thallium. The site-related cancer risk and noncancer hazard index is below  $1 \times 10^{-6}$  and 1.0, respectively. Therefore, the risk to humans from soil at TAA 765 is acceptable.

The detected concentrations in rinse water collected from the decontaminated concrete pad at TAA 765 were compared to source water concentrations. The rinse water was determined to be within the range of source water concentrations.

## ***Section 7***

# ***Conclusions and Recommendations***

This section presents the conclusions and recommendations for the decontamination and sampling conducted for the TAA 765 site.

TAA 765 is located within the IRP Site 13 boundary. A "No Action" ROD was signed for Site 13 in October 1997. All the analytes in the shallow soil that were detected above MCAS El Toro background concentrations at TAA 765 site are consistent with the Site 13 list of analytes above MCAS El Toro background concentrations. Also, the concentrations of the TAA 765 analytes are well within the range of Site 13 detected analyte concentrations. Based on the review of analytical data, no indications of hazardous contaminants were found in the soil under or around the TAA. Therefore, the use of the TAA did not impact the soil at TAA 765. Following decontamination procedures, no significant concentrations of contaminants were detected in the rinsate.

Of the analytes reported by the laboratory, BEHP is a common laboratory and sampling contaminant as previously discussed. The various metals detected in the soil samples were all at concentrations below the established MCAS El Toro background levels or the PRGs. The various metals detected in the rinsate sample were consistent in identity and concentration with the metals and levels measured in the source water. Bromodichloromethane, chloroform and dibromochloromethane are THMs commonly found in chlorinated potable water supplies such as the source water used for the decontamination of TAA 765.

The few chemicals that were detected in the soil at or above the background or PRG levels were analyzed to determine the risk associated with their presence. Even though it is considered to be a laboratory induced contaminant, BEHP was included in the risk calculations and the resulting risk level is still acceptable. The risk calculations for the TAA 765 site resulted in a site-related cancer risk of  $1.5 \times 10^{-8}$  and a site-related noncancer hazard index of 0.03, both of which are below the generally accepted levels of exposure.

The objectives of this project are considered to be achieved, since the physical removal of all wastes was verified. Decontamination activities (vacuuming, scrubbing, and pressure washing) were performed to remove any possible contamination, and confirmation sampling was conducted to verify that concentrations of contaminants were at or below acceptable background or health-risk based concentrations.

Based on the information provided, closure goals were achieved with respect to soil and rinsate water for TAA 765; therefore, TAA 765 (also known as SWMU 266) should be identified as "closed".

## ***Section 8***

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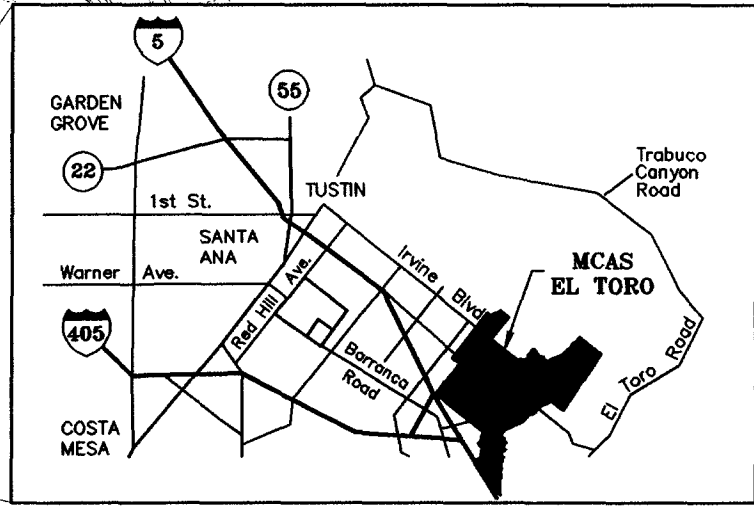
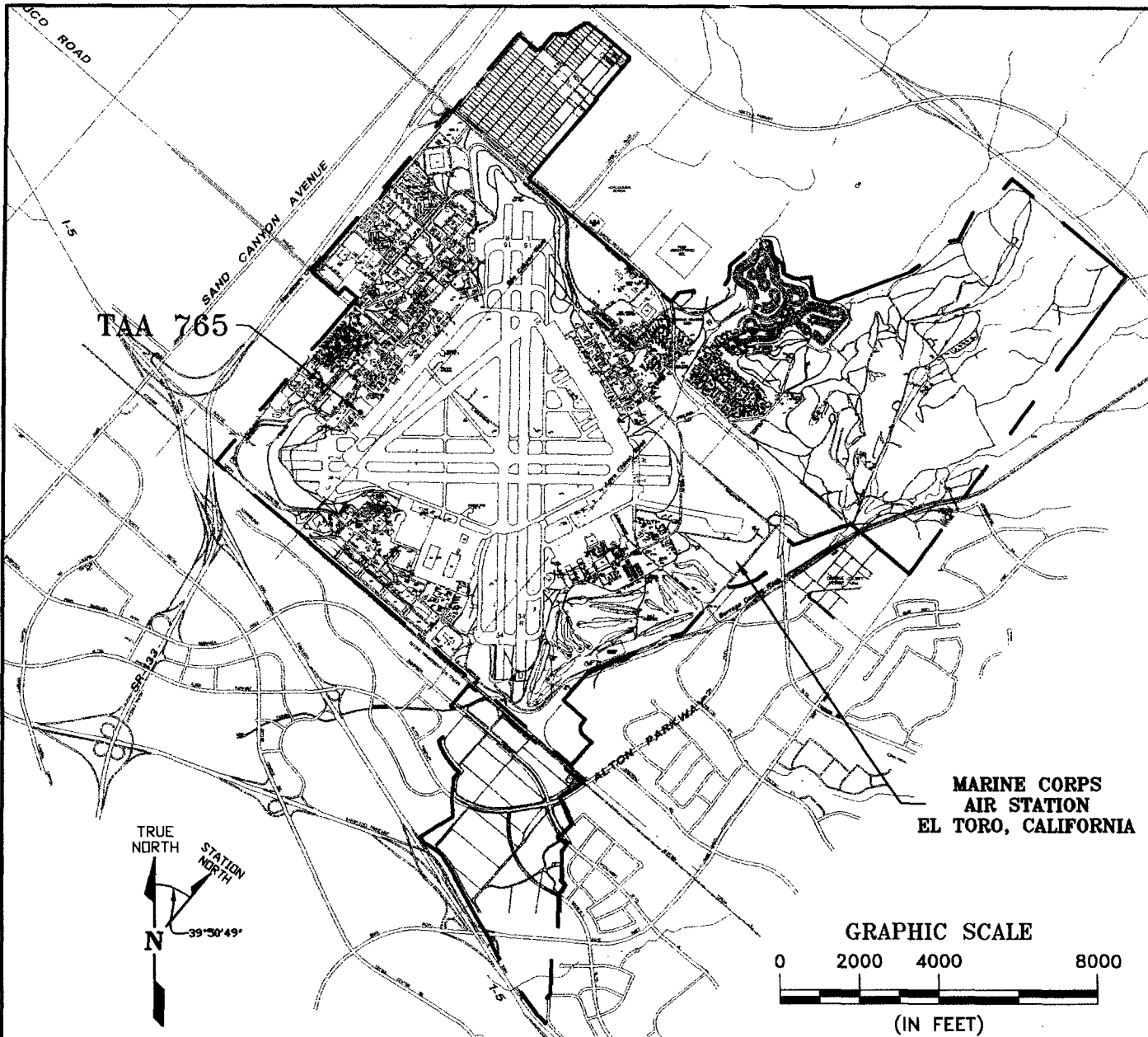
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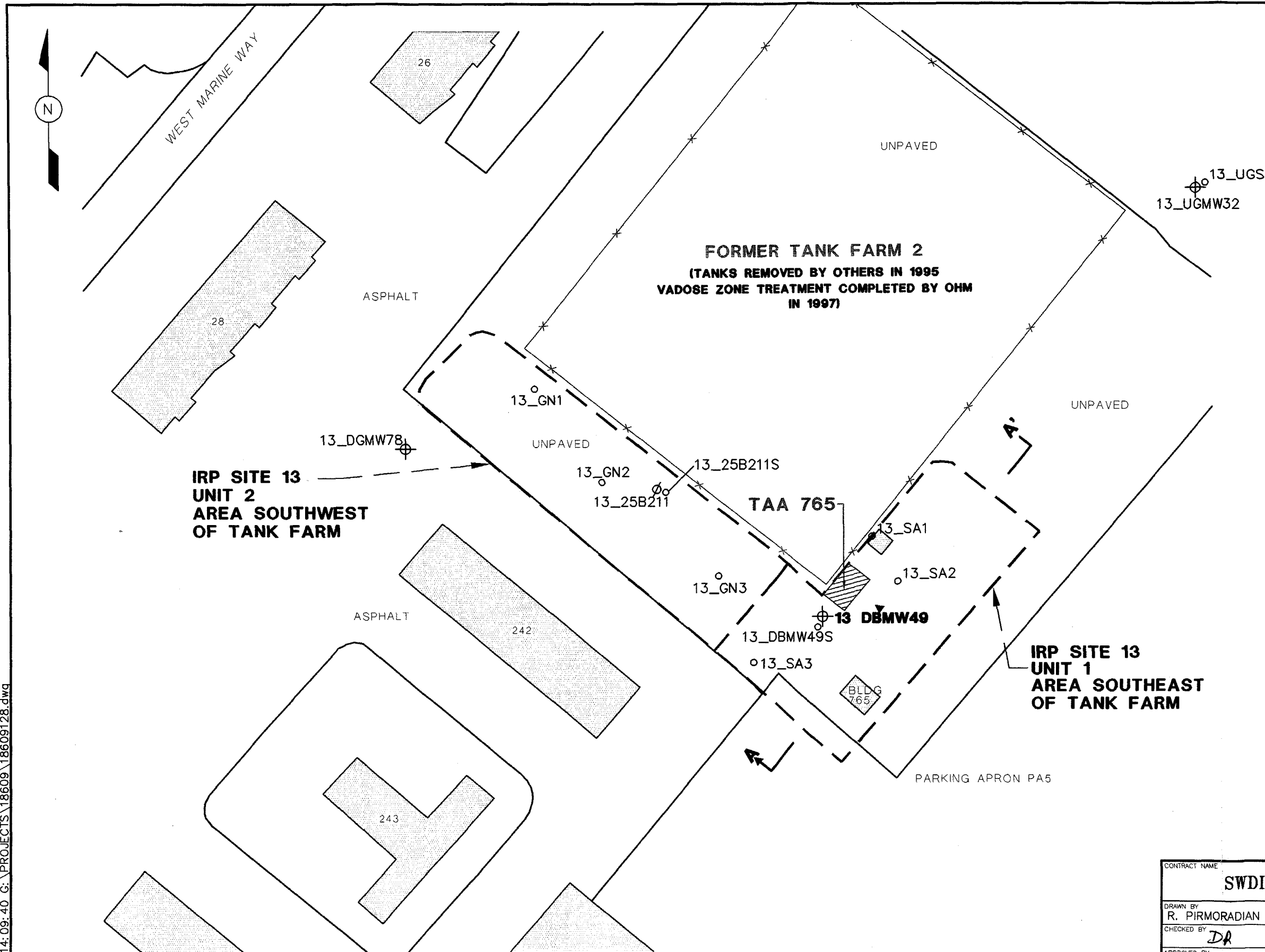
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CONTRACT NAME <b>SWDIV</b>				CHECKED BY <b>DR</b>		DATE <b>7/20/98</b>											
				APPROVED BY <b>JN</b>		DATE <b>7/20/98</b>											
				PROJECT MANAGER		DATE											
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**EXPLANATION:**

10' BUILDING OR PAD

IMPROVED ROADS

FENCE

UNIT BOUNDARY

NOTE: TAA - TEMPORARY ACCUMULATION AREA  
SVE - SOIL VAPOR EXTRACTION

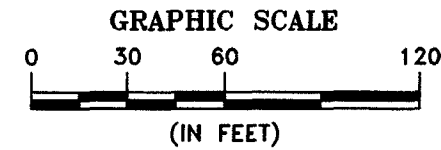
**APPROXIMATE SAMPLING LOCATIONS**

PHASE I MONITORING WELL

PHASE I DEEP OR ANGLE BORING

PHASE I SURFACE AND NEAR SURFACE SOIL SAMPLE

REFER TO FIGURE 6-1

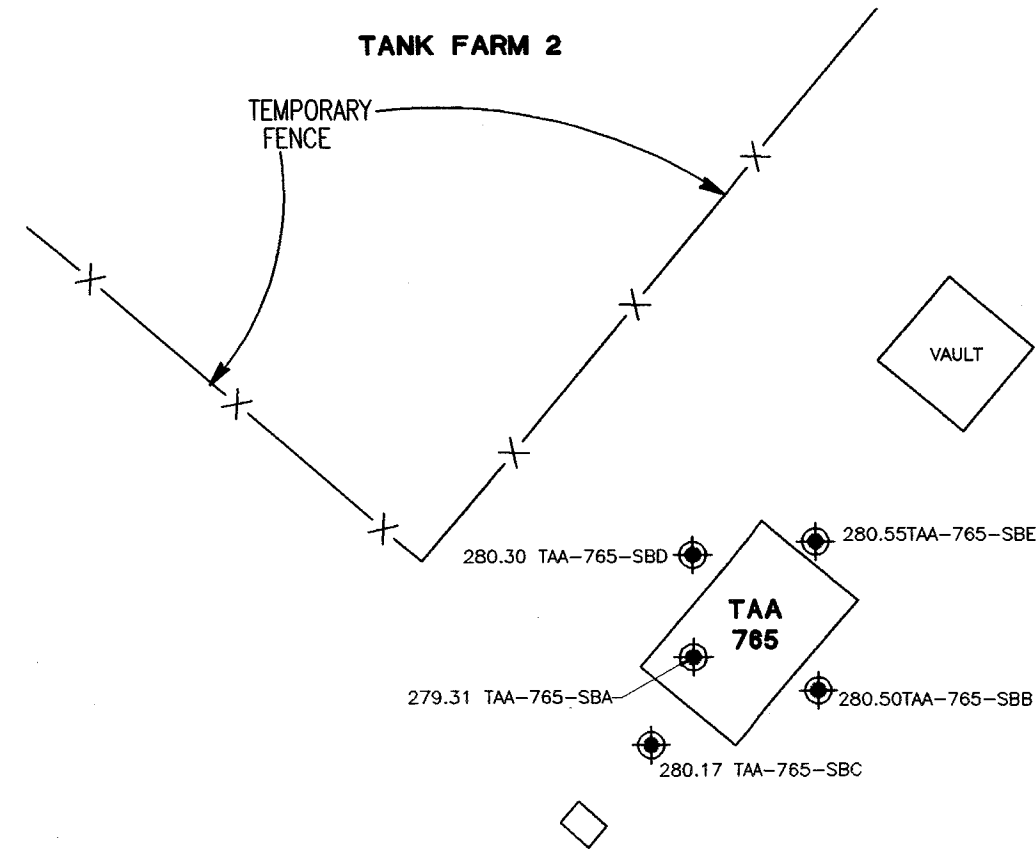


REVISIONS			
REV. No.	DESCRIPTION	DATE	APPROVED
01	103 2087.DWG	11/5/96	

CONTRACT NAME <b>SWDIV</b>		<b>OHM Remediation Services Corp.</b> A Subsidiary of OHM Corporation SAN DIEGO, CA	
DRAWN BY R. PIRMORADIAN		DATE 07/20/98	
CHECKED BY <i>DR</i>		DATE 7/20/98	
APPROVED BY <i>jm</i>		DATE 7/20/98	
PROJECT MANAGER		DATE	
AUTOCAD FILE No. 18609128.DWG			
SCALE AS NOTED	SHEET 1	OF 1	DOCUMENT CONTROL No. SW5246
OHM PROJECT No. 18609		DRAWING No. FIG 2-1	

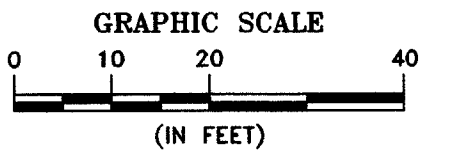
VICINITY MAP  
TAA 765 AND SITE 13

MARINE CORPS AIR STATION  
EL TORO, CALIFORNIA




EXPLANATION:

⊙ SAMPLE LOCATION

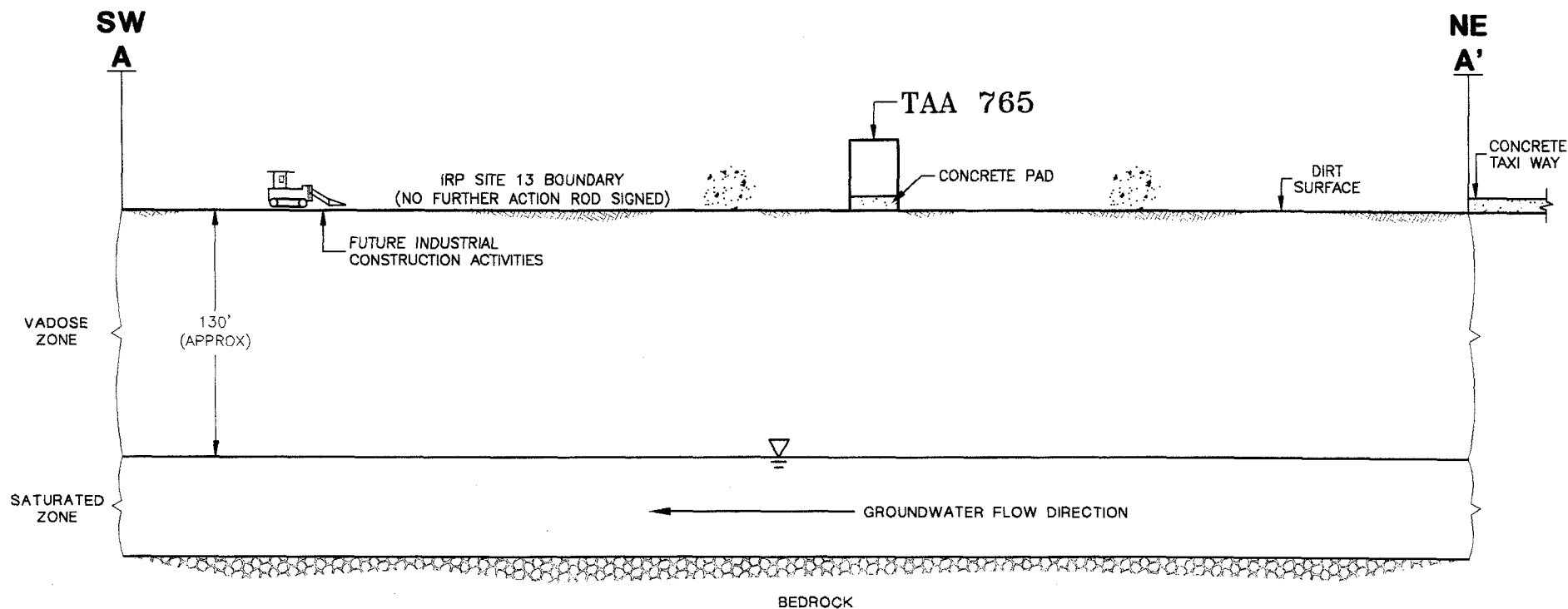


REVISIONS			
REV. No.	DESCRIPTION	DATE	APPROVED
01	97102-51.DWG BY CALVADA		

CONTRACT NAME <b>SWDIV</b>		 <b>OHM Remediation Services Corp.</b> A Subsidiary of OHM Corporation SAN DIEGO, CA	
DRAWN BY R. PIRMORADIAN		DATE 07/20/98	
CHECKED BY <i>DR</i>		DATE 7/20/98	
APPROVED BY <i>DR</i>		DATE 7/20/98	
PROJECT MANAGER		DATE	
AUTOCAD FILE No. 18609129.DWG			
SCALE AS NOTED	SHEET 1	OF 1	DOCUMENT CONTROL No. SW5246
OHM PROJECT No. 18609		DRAWING No. FIG 3-1	

**SITE PLAN**  
**TAA 765**

**MARINE CORPS AIR STATION**  
**EL TORO, CALIFORNIA**



# **EXPLANATION:**


## **RECEPTORS:**

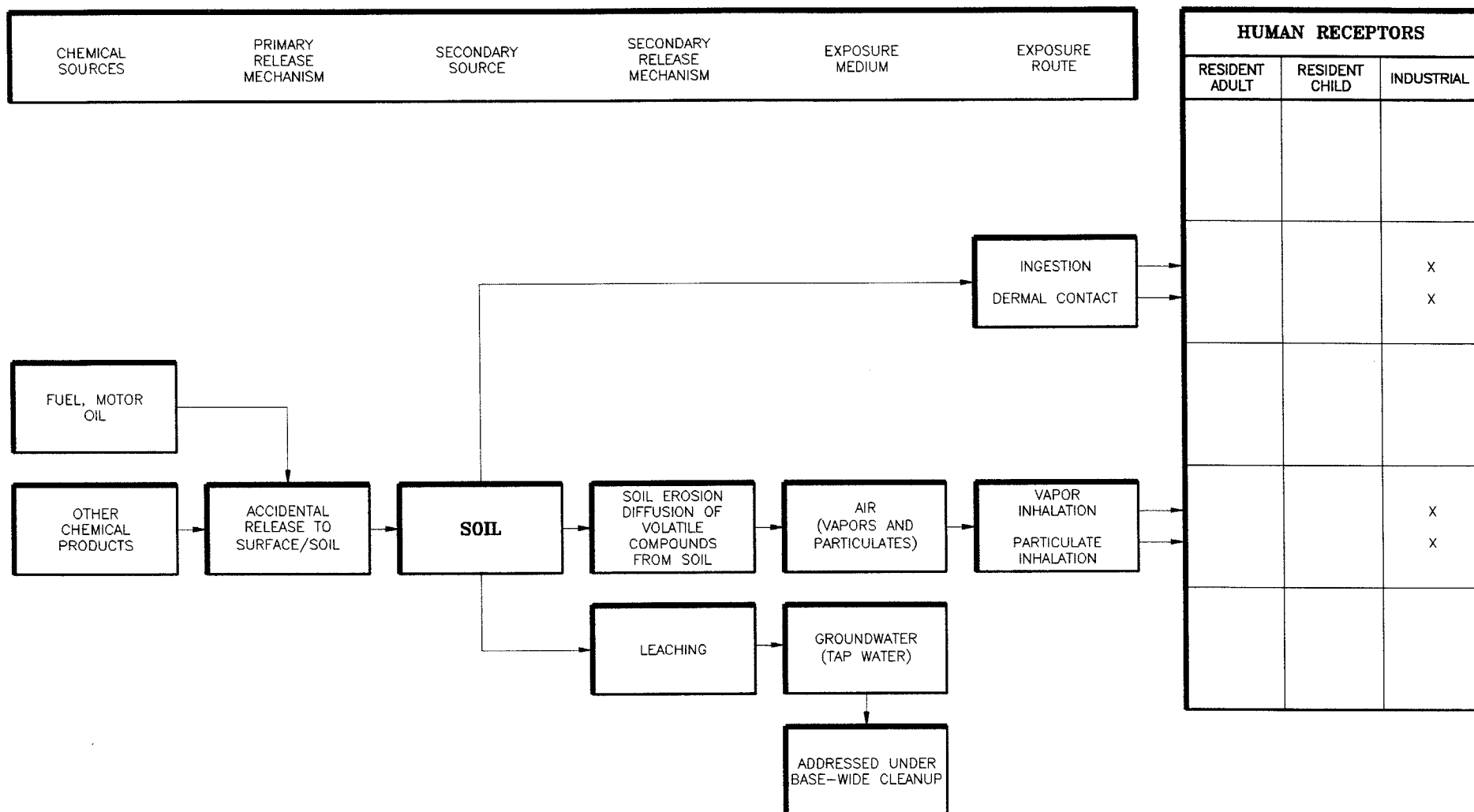


## **PATHWAYS:**



REFERENCE:  
103M2088.DWG

 <b>OHM Remediation Services Corp.</b> A Subsidiary of OHM Corporation SAN DIEGO, CA		DRAWN BY R. PIRMORADIAN		DATE 07/20/98		<b>CONCEPTUAL SITE MODEL TAA 765</b>  <b>MARINE CORPS AIR STATION EL TORO, CALIFORNIA</b>	
		CHECKED BY DR		DATE 7/21/98			
		APPROVED BY [Signature]		DATE 7/21/98			
CONTRACT NAME <b>SWDIV</b>				PROJECT MANAGER		DATE	
AUTOCAD FILE No.	PLOT SCALE	SHEET	OF	SCALE	DOCUMENT CONTROL No.	OHM PROJECT No.	FIGURE No.
18609127.DWG	1 = 1	1	1	AS NOTED	NA	18609	FIG 6-1

**EXPLANATION:**

X COMPLETE PATHWAY

**REFERENCE:**  
 103C2089.DXF

<b>OHM Remediation Services Corp.</b> A Subsidiary of OHM Corporation SAN DIEGO, CA				DRAWN BY R. PIRMORADIAN	DATE 07/20/98	<b>POTENTIAL MIGRATION PATHWAYS EXPOSURE ROUTES AND RECEPTORS TAA 765</b>  <b>MARINE CORPS AIR STATION EL TORO, CALIFORNIA</b>	
				CHECKED BY <i>DR</i>	DATE 7/20/98		
CONTRACT NAME <b>SWDIV</b>				APPROVED BY <i>JM</i>	DATE 7/20/98		
				PROJECT MANAGER		DATE	
AUTOCAD FILE No. 18609126.DWG	PLOT SCALE 1 = 1	SHEET 1	OF 1	SCALE AS NOTED	DOCUMENT CONTROL No. SW5246	OHM PROJECT No. 18609	FIGURE No. FIG 6-2

## *Tables*

**Table 4-1****Sample Collection Summary Log -TAA 765**

OHM Sample Number	OHM Sample Location	Sample Matrix	Date Collected	TPH AS DIESEL	TPH AS GASOLINE	TPH AS JP-5	EPA 8081	EPA 8260A	EPA 8270B	EPA 150.1	EPA 6010A
18609-709	TAA765-SBA	Soil	10/21/97	X	X	X	X	X	X		X
18609-710	TAA765-SBA	Soil	10/21/97					X	X		
18609-711	TAA765-SBB	Soil	10/21/97	X	X	X	X	X	X		X
18609-712	TAA765-SBB	Soil	10/21/97					X			
18609-713	TAA765-SBC	Soil	10/21/97	X	X	X	X	X	X		X
18609-714	TAA765-SBC	Soil	10/21/97					X			
18609-715	TAA765-SBD	Soil	10/21/97	X	X	X	X	X	X		X
18609-716	TAA765-SBD	Soil	10/21/97					X			
18609-717	TAA765-SBE	Soil	10/21/97	X	X	X	X	X	X		X
18609-718	TAA765-SBE	Soil	10/21/97					X			
18609-743	Source Blank	Water	10/30/97	X	X	X	X	X	X	X	X
18609-753	TAA765-Rinse	Water	11/03/97	X	X	X	X	X	X		X

**Table 4-1****Sample Collection Summary Log -TAA 765**

OHM Sample Number	OHM Sample Location	Sample Matrix	Date Collected	EPA 7060A	EPA 7421	EPA 7470A	EPA 7471A	EPA 7740	EPA 9010A	EPA 9040	EPA 9045
18609-709	TAA765-SBA	Soil	10/21/97	X	X		X	X	X		X
18609-710	TAA765-SBA	Soil	10/21/97								
18609-711	TAA765-SBB	Soil	10/21/97	X	X		X	X	X		X
18609-712	TAA765-SBB	Soil	10/21/97								
18609-713	TAA765-SBC	Soil	10/21/97	X	X		X	X	X		X
18609-714	TAA765-SBC	Soil	10/21/97								
18609-715	TAA765-SBD	Soil	10/21/97	X	X		X	X	X		X
18609-716	TAA765-SBD	Soil	10/21/97								
18609-717	TAA765-SBE	Soil	10/21/97	X	X		X	X	X		X
18609-718	TAA765-SBE	Soil	10/21/97								
18609-743	Source Blank	Water	10/30/97	X	X	X		X	X		
18609-753	TAA765-Rinse	Water	11/03/97	X	X	X		X	X	X	



**Table 4-2****Confirmation Soil Sample Analytical Results -TAA 765**

OHM Sample Number				18609-709	18609-710	18609-711	18609-712	18609-713	18609-714
Sample Location				TAA765-SBA	TAA765-SBA	TAA765-SBB	TAA765-SBB	TAA765-SBC	TAA765-SBC
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0	1.5	3.0
CA LUFT 8015M	Unit	Background	PRG						
TPH as Gasoline	mg/kg	NE	NE	11 U	NA	11 U	NA	11 U	NA
TPH as Diesel	mg/kg	NE	NE	530	NA	11 U	NA	11 U	NA
TPH as JP-5	mg/kg	NE	NE	230 U	NA	11 U	NA	11 U	NA
EPA 8081									
4,4'-DDD	µg/kg	58.6	7900	4.6 U	NA	2.2 U	NA	2.3 U	NA
4,4'-DDE	µg/kg	233	5600	4.6 U	NA	2.2 U	NA	2.3 U	NA
4,4'-DDT	µg/kg	272	5600	4.6 U	NA	2.2 U	NA	2.3 U	NA
Aldrin	µg/kg	NE	110	4.6 U	NA	2.2 U	NA	2.3 U	NA
alpha-BHC	µg/kg	NE	300	1.6 UJ	NA	0.78 UJ	NA	0.8 UJ	NA
alpha-Chlordane	µg/kg	17.7	1500	4.6 U	NA	2.2 U	NA	2.3 U	NA
Aroclor-1016	µg/kg	NE	65000	76 UJ	NA	37 UJ	NA	37 UJ	NA
Aroclor-1221	µg/kg	NE	340	76 U	NA	37 U	NA	37 U	NA
Aroclor-1232	µg/kg	NE	340	76 U	NA	37 U	NA	37 U	NA
Aroclor-1242	µg/kg	NE	340	76 U	NA	37 U	NA	37 U	NA
Aroclor-1248	µg/kg	NE	340	76 U	NA	37 U	NA	37 U	NA
Aroclor-1254	µg/kg	NE	19000	76 U	NA	37 U	NA	37 U	NA
Aroclor-1260	µg/kg	NE	340	76 U	NA	37 U	NA	37 U	NA
Beta-BHC	µg/kg	NE	1100	4.6 U	NA	2.2 U	NA	2.3 U	NA
Delta-BHC	µg/kg	NE	NE	4.6 UJ	NA	2.2 UJ	NA	2.3 UJ	NA
Dieldrin	µg/kg	118	120	4.6 U	NA	2.2 U	NA	2.3 U	NA
Endosulfan I	µg/kg	0.179	4100000	1.6 U B	NA	0.78 U B	NA	0.8 U B	NA
Endosulfan II	µg/kg	10.6	4100000	4.6 U	NA	2.2 U	NA	2.3 U	NA
Endosulfan sulfate	µg/kg	4.21	4100000	4.6 U B	NA	2.2 U	NA	2.3 U	NA
Endrin	µg/kg	19.9	200000	4.6 U	NA	2.2 U	NA	2.3 U	NA
Endrin aldehyde	µg/kg	41.7	200000	4.6 U	NA	2.2 U	NA	2.3 U	NA
Endrin ketone	µg/kg	19.9	200000	4.6 U	NA	2.2 U	NA	2.3 U	NA
gamma-BHC	µg/kg	NE	1500	4.6 UJ	NA	2.2 U	NA	2.3 UJ	NA
gamma-Chlordane	µg/kg	18	1500	4.6 U	NA	2.2 U	NA	2.3 U	NA
Heptachlor	µg/kg	NE	420	4.6 U	NA	2.2 U	NA	2.3 U	NA

**Table 4-2****Confirmation Soil Sample Analytical Results -TAA 765**

OHM Sample Number				18609-709	18609-710	18609-711	18609-712	18609-713	18609-714
Sample Location				TAA765-SBA	TAA765-SBA	TAA765-SBB	TAA765-SBB	TAA765-SBC	TAA765-SBC
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0	1.5	3.0
	Unit	Background	PRG						
Heptachlor epoxide	µg/kg	NE	210	4.6 U	NA	2.2 U	NA	2.3 U	NA
Methoxychlor	µg/kg	NE	3400000	4.6 U	NA	2.2 U	NA	2.3 U	NA
Toxaphene	µg/kg	NE	1700	390 U	NA	190 U	NA	190 U	NA
<b>EPA 8260A</b>									
1,1,1-Trichloroethane	µg/kg	NE	3000000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
1,1,2,2-Tetrachloroethane	µg/kg	NE	1100	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
1,1,2-Trichloroethane	µg/kg	NE	1500	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
1,1-Dichloroethane	µg/kg	NE	1700000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
1,1-Dichloroethene	µg/kg	NE	80	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
1,2-Dichloroethane	µg/kg	NE	550	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
1,2-Dichloropropane	µg/kg	NE	680	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
2-Butanone (MEK)	µg/kg	NE	27000000	57 UJ	60 U	55 UJ	58 U	57 UJ	54 U
2-Chloroethyl vinyl ether	µg/kg	NE	NE	57 U	60 UJ	55 U	58 UJ	57 U	54 UJ
2-Hexanone	µg/kg	NE	NE	57 UJ	60 UJ	55 UJ	58 UJ	57 UJ	54 UJ
4-Methyl-2-pentanone (MIBK)	µg/kg	NE	2800000	57 UJ	60 UJ	55 UJ	58 UJ	57 UJ	54 UJ
Acetone	µg/kg	NE	8800000	57 UJ	60 UJ	55 UJ	58 UJ	57 UJ	54 UJ
Benzene	µg/kg	NE	1400	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Bromodichloromethane	µg/kg	NE	1400	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Bromoform	µg/kg	NE	240000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Bromomethane	µg/kg	NE	23000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Carbon tetrachloride	µg/kg	NE	500	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Chlorobenzene	µg/kg	NE	220000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Chloroethane	µg/kg	NE	NE	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Chloroform	µg/kg	NE	530	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Chloromethane	µg/kg	NE	2600	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
cis-1,2-Dichloroethene	µg/kg	NE	100000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
cis-1,3-Dichloropropene	µg/kg	NE	550	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Dibromochloromethane	µg/kg	NE	23000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Ethylbenzene	µg/kg	NE	230000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Methyl tert-butyl ether (MTBE)	µg/kg	NE	NE	11 U	12 U	11 U	12 U	11 U	11 U

Table 4-2

## Confirmation Soil Sample Analytical Results -TAA 765

OHM Sample Number				18609-709	18609-710	18609-711	18609-712	18609-713	18609-714
Sample Location				TAA765-SBA	TAA765-SBA	TAA765-SBB	TAA765-SBB	TAA765-SBC	TAA765-SBC
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0	1.5	3.0
	Unit	Background	PRG						
Methylene chloride	µg/kg	NE	18000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Styrene	µg/kg	NE	680000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Tetrachloroethene	µg/kg	NE	17000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Toluene	µg/kg	NE	880000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
trans-1,2-Dichloroethene	µg/kg	NE	270000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
trans-1,3-Dichloropropene	µg/kg	NE	550	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Trichloroethene	µg/kg	NE	7000	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Vinyl acetate	µg/kg	NE	2500000	11 UJ	12 UJ	11 UJ	12 UJ	11 UJ	11 UJ
Vinyl Chloride	µg/kg	NE	35	5.7 U	6 U	5.5 U	5.8 U	5.7 U	5.4 U
Xylenes (total)	µg/kg	NE	320000	17 U	18 U	17 U	17 U	17 U	16 U
<b>EPA 8270B</b>									
1,2,4-Trichlorobenzene	µg/kg	NE	5500000	3800 U	390 U	370 U	NA	370 U	NA
1,2-Dichlorobenzene	µg/kg	NE	700000	3800 U	390 U	370 U	NA	370 U	NA
1,3-Dichlorobenzene	µg/kg	NE	860000	3800 U	390 U	370 U	NA	370 U	NA
1,4-Dichlorobenzene	µg/kg	NE	8500	3800 U	390 U	370 U	NA	370 U	NA
2,4,5-Trichlorophenol	µg/kg	NE	68000000	3800 U	390 U	370 U	NA	370 U	NA
2,4,6-Trichlorophenol	µg/kg	NE	170000	3800 U	390 U	370 U	NA	370 U	NA
2,4-Dichlorophenol	µg/kg	NE	2000000	3800 U	390 U	370 U	NA	370 U	NA
2,4-Dimethylphenol	µg/kg	NE	14000000	3800 U	390 U	370 U	NA	370 U	NA
2,4-Dinitrophenol	µg/kg	NE	1400000	9500 U	990 U	920 U	NA	940 U	NA
2,4-Dinitrotoluene	µg/kg	NE	1400000	3800 U	390 U	370 U	NA	370 U	NA
2,6-Dinitrotoluene	µg/kg	NE	680000	3800 U	390 U	370 U	NA	370 U	NA
2-Chloronaphthalene	µg/kg	NE	110000	3800 U	390 U	370 U	NA	370 U	NA
2-Chlorophenol	µg/kg	NE	370000	3800 U	390 U	370 U	NA	370 U	NA
2-Methyl-4,6-dinitrophenol	µg/kg	NE	NE	9500 U	990 U	920 U	NA	940 U	NA
2-Methylnaphthalene	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
2-Methylphenol	µg/kg	NE	34000000	3800 U	390 U	370 U	NA	370 U	NA
2-Nitroaniline	µg/kg	NE	41000	3800 U	390 U	370 U	NA	370 U	NA
2-Nitrophenol	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
3,3'-Dichlorobenzidine	µg/kg	NE	4200	3800 U	390 U	370 U	NA	370 U	NA

Table 4-2

## Confirmation Soil Sample Analytical Results -TAA 765

OHM Sample Number				18609-709	18609-710	18609-711	18609-712	18609-713	18609-714
Sample Location				TAA765-SBA	TAA765-SBA	TAA765-SBB	TAA765-SBB	TAA765-SBC	TAA765-SBC
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0	1.5	3.0
	Unit	Background	PRG						
3-Methyl-4-chlorophenol	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
3-Nitroaniline	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
4-Bromophenyl phenyl ether	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
4-Chloroaniline	µg/kg	NE	2700000	3800 U	390 U	370 U	NA	370 U	NA
4-Chlorophenyl phenyl ether	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
4-Methylphenol	µg/kg	NE	3400000	3800 U	390 U	370 U	NA	370 U	NA
4-Nitroaniline	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
4-Nitrophenol	µg/kg	NE	NE	9500 U	990 U	920 U	NA	940 U	NA
Acenaphthene	µg/kg	NE	110000	3800 U	390 U	370 U	NA	370 U	NA
Acenaphthylene	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
Anthracene	µg/kg	NE	5700	3800 U	390 U	370 U	NA	370 U	NA
Benzo[a]anthracene	µg/kg	NE	2600	3800 UX P	390 U	370 U	NA	370 U	NA
Benzo[a]pyrene	µg/kg	NE	260	200 U	39 U	37 U	NA	37 U	NA
Benzo[b]fluoranthene	µg/kg	NE	2600	3800 UX P	390 U	370 U	NA	370 U	NA
Benzo[ghi]perylene	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
Benzo[k]fluoranthene	µg/kg	NE	26000	3800 U	390 U	370 U	NA	370 U	NA
Bis (2-chloroethoxy)methane	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
Bis (2-chloroethyl)ether	µg/kg	NE	97	200 UY P	39 U	37 U	NA	37 U	NA
Bis (2-chloroisopropyl)ether	µg/kg	NE	27000	3800 U	390 U	370 U	NA	370 U	NA
Bis (2-ethylhexyl)phthalate	µg/kg	NE	140000	3800 U	390 U	370 U	NA	370 U	NA
Butyl benzyl phthalate	µg/kg	NE	930000	3800 U	390 U	370 U	NA	370 U	NA
Chrysene	µg/kg	NE	7200	3800 U	390 U	370 U	NA	370 U	NA
Di-n-butyl phthalate	µg/kg	NE	68000000	3800 U	390 U	370 U	NA	370 U	NA
Di-n-octyl phthalate	µg/kg	NE	10000000	3800 U	390 U	370 U	NA	370 U	NA
Dibenz[a,h]anthracene	µg/kg	NE	260	200 U	39 U	37 U	NA	37 U	NA
Dibenzofuran	µg/kg	NE	140000	3800 U	390 U	370 U	NA	370 U	NA
Diethyl phthalate	µg/kg	NE	100000000	3800 U	390 U	370 U	NA	370 U	NA
Dimethyl phthalate	µg/kg	NE	100000000	3800 U	390 U	370 U	NA	370 U	NA
Fluoranthene	µg/kg	NE	27000000	3800 U	390 U	370 U	NA	370 U	NA
Fluorene	µg/kg	NE	90000	3800 U	390 U	370 U	NA	370 U	NA

Table 4-2

## Confirmation Soil Sample Analytical Results -TAA 765

OHM Sample Number				18609-709	18609-710	18609-711	18609-712	18609-713	18609-714
Sample Location				TAA765-SBA	TAA765-SBA	TAA765-SBB	TAA765-SBB	TAA765-SBC	TAA765-SBC
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0	1.5	3.0
	Unit	Background	PRG						
Hexachlorobenzene	µg/kg	NE	1200	760 U	390 U	370 U	NA	370 U	NA
Hexachlorobutadiene	µg/kg	NE	24000	3800 U	390 U	370 U	NA	370 U	NA
Hexachlorocyclopentadiene	µg/kg	NE	4600000	3800 U	390 U	370 U	NA	370 U	NA
Hexachloroethane	µg/kg	NE	140000	3800 U	390 U	370 U	NA	370 U	NA
Indeno[1,2,3-cd]pyrene	µg/kg	NE	2600	380 U	390 U	370 U	NA	370 U	NA
N-Nitrosodi-n-propylamine	µg/kg	NE	270	200 U	39 U	37 U	NA	37 U	NA
N-Nitrosodiphenylamine	µg/kg	NE	390000	3800 U	390 U	370 U	NA	370 U	NA
Naphthalene	µg/kg	NE	240000	3800 U	390 U	370 U	NA	370 U	NA
Nitrobenzene	µg/kg	NE	94000	3800 U	390 U	370 U	NA	370 U	NA
Pentachlorophenol	µg/kg	NE	7900	2000 UJ	790 U	730 U	NA	750 U	NA
Phenanthrene	µg/kg	NE	NE	3800 U	390 U	370 U	NA	370 U	NA
Phenol	µg/kg	NE	100000000	3800 U	390 U	370 U	NA	370 U	NA
Pyrene	µg/kg	NE	100000	3800 U	390 U	370 U	NA	370 U	NA
<b>EPA 6010A</b>									
Aluminum	mg/kg	18600	100000	4700	NA	6900	NA	9800	NA
Antimony	mg/kg	4.5	680	5.7 U B	NA	5.5 U B	NA	5.7 U B	NA
Barium	mg/kg	220	100000	74	NA	180	NA	140	NA
Beryllium	mg/kg	0.893	1.1	0.25	NA	0.40	NA	0.48	NA
Cadmium	mg/kg	11.4	850	0.57 U	NA	0.55 U	NA	0.57 U	NA
Calcium	mg/kg	67600	NE	3400	NA	8500	NA	4200	NA
Chromium	mg/kg	39.6	450	6.4	NA	9.1	NA	10.0	NA
Cobalt	mg/kg	7.96	97000	3.6	NA	5.7	NA	6.2	NA
Copper	mg/kg	37.9	63000	3.0	NA	5.7	NA	6.5	NA
Iron	mg/kg	19000	NE	7800	NA	11000	NA	16000	NA
Magnesium	mg/kg	11100	NE	2900	NA	5300	NA	5600	NA
Manganese	mg/kg	574	43000	110	NA	210	NA	250	NA
Molybdenum	mg/kg	NE	8500	2.3 U	NA	2.2 U	NA	2.3 U	NA
Nickel	mg/kg	71.1	34000	4.5	NA	5.9	NA	6.5	NA
Potassium	mg/kg	5560	NE	2100	NA	3400	NA	4500	NA
Silver	mg/kg	0.65	8500	1.1 U B	NA	1.1 U B	NA	1.1 U B	NA

**Table 4-2****Confirmation Soil Sample Analytical Results -TAA 765**

OHM Sample Number				18609-709	18609-710	18609-711	18609-712	18609-713	18609-714
Sample Location				TAA765-SBA	TAA765-SBA	TAA765-SBB	TAA765-SBB	TAA765-SBC	TAA765-SBC
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0	1.5	3.0
	Unit	Background	PRG						
Sodium	mg/kg	483	NE	110	NA	310	NA	180	NA
Thallium	mg/kg	0.53	120	5.7 U B	NA	5.5 U B	NA	5.7 U B	NA
Vanadium	mg/kg	102	12000	17	NA	24	NA	30	NA
Zinc	mg/kg	104	100000	54	NA	44	NA	50	NA
<b>EPA 7060A</b>									
Arsenic	mg/kg	8.5	2.4	1.00	NA	1.7	NA	1.6	NA
<b>EPA 7421</b>									
Lead	mg/kg	22.9	1000	1.3	NA	1.7	NA	2.0	NA
<b>EPA 7471A</b>									
Mercury	mg/kg	0.41	NE	0.092 U	NA	0.089 U	NA	0.091 U	NA
<b>EPA 7740</b>									
Selenium	mg/kg	0.37	8500	0.57 U B	NA	0.55 U B	NA	0.57 U B	NA
<b>EPA 9045</b>									
pH	pH units	NE	NE	7.9	NA	8.9	NA	8.1	NA

**Table 4-2****Confirmation Soil Sample Analytical Results -TAA 765**

OHM Sample Number				18609-715	18609-716	18609-717	18609-718
Sample Location				TAA765-SBD	TAA765-SBD	TAA765-SBE	TAA765-SBE
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0
CA LUFT 8015M	Unit	Background	PRG				
TPH as Gasoline	mg/kg	NE	NE	11 U	NA	11 U	NA
TPH as Diesel	mg/kg	NE	NE	11 U	NA	11 U	NA
TPH as JP-5	mg/kg	NE	NE	11 U	NA	11 U	NA
<b>EPA 8081</b>							
4,4'-DDD	µg/kg	58.6	7900	2.2 U	NA	2.2 U	NA
4,4'-DDE	µg/kg	233	5600	2.2 U	NA	2.2 U	NA
4,4'-DDT	µg/kg	272	5600	2.2 U	NA	2.2 U	NA
Aldrin	µg/kg	NE	110	2.2 U	NA	2.2 U	NA
alpha-BHC	µg/kg	NE	300	0.79 UJ	NA	0.79 UJ	NA
alpha-Chlordane	µg/kg	17.7	1500	2.2 U	NA	2.2 U	NA
Aroclor-1016	µg/kg	NE	65000	37 UJ	NA	37 UJ	NA
Aroclor-1221	µg/kg	NE	340	37 U	NA	37 U	NA
Aroclor-1232	µg/kg	NE	340	37 U	NA	37 U	NA
Aroclor-1242	µg/kg	NE	340	37 U	NA	37 U	NA
Aroclor-1248	µg/kg	NE	340	37 U	NA	37 U	NA
Aroclor-1254	µg/kg	NE	19000	37 U	NA	37 U	NA
Aroclor-1260	µg/kg	NE	340	37 U	NA	37 U	NA
Beta-BHC	µg/kg	NE	1100	2.2 U	NA	2.2 UJ	NA
Delta-BHC	µg/kg	NE	NE	2.2 UJ	NA	2.2 U	NA
Dieldrin	µg/kg	118	120	2.2 U	NA	2.2 U	NA
Endosulfan I	µg/kg	0.179	4100000	0.79 U B	NA	0.79 U B	NA
Endosulfan II	µg/kg	10.6	4100000	2.2 U	NA	2.2 U	NA
Endosulfan sulfate	µg/kg	4.21	4100000	2.2 U	NA	2.2 U	NA
Endrin	µg/kg	19.9	200000	2.2 U	NA	2.2 U	NA
Endrin aldehyde	µg/kg	41.7	200000	2.2 U	NA	2.2 U	NA
Endrin ketone	µg/kg	19.9	200000	2.2 U	NA	2.2 U	NA
gamma-BHC	µg/kg	NE	1500	2.2 UJ	NA	2.2 UJ	NA
gamma-Chlordane	µg/kg	18	1500	2.2 U	NA	2.2 U	NA
Heptachlor	µg/kg	NE	420	2.2 U	NA	2.2 U	NA

**Table 4-2****Confirmation Soil Sample Analytical Results -TAA 765**

OHM Sample Number				18609-715	18609-716	18609-717	18609-718
Sample Location				TAA765-SBD	TAA765-SBD	TAA765-SBE	TAA765-SBE
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0
	Unit	Background	PRG				
Heptachlor epoxide	µg/kg	NE	210	2.2 U	NA	2.2 U	NA
Methoxychlor	µg/kg	NE	3400000	2.2 U	NA	2.2 U	NA
Toxaphene	µg/kg	NE	1700	190 U	NA	190 U	NA
<b>EPA 8260A</b>							
1,1,1-Trichloroethane	µg/kg	NE	3000000	5.6 U	6.1 U	5.6 U	5.7 U
1,1,2,2-Tetrachloroethane	µg/kg	NE	1100	5.6 U	6.1 U	5.6 U	5.7 U
1,1,2-Trichloroethane	µg/kg	NE	1500	5.6 U	6.1 U	5.6 U	5.7 U
1,1-Dichloroethane	µg/kg	NE	1700000	5.6 U	6.1 U	5.6 U	5.7 U
1,1-Dichloroethene	µg/kg	NE	80	5.6 U	6.1 U	5.6 U	5.7 U
1,2-Dichloroethane	µg/kg	NE	550	5.6 U	6.1 U	5.6 U	5.7 U
1,2-Dichloropropane	µg/kg	NE	680	5.6 U	6.1 U	5.6 U	5.7 U
2-Butanone (MEK)	µg/kg	NE	27000000	56 UJ	61 UJ	56 U	57 U
2-Chloroethyl vinyl ether	µg/kg	NE	NE	56 U	61 UJ	56 UJ	57 UJ
2-Hexanone	µg/kg	NE	NE	56 UJ	61 UJ	56 UJ	57 UJ
4-Methyl-2-pentanone (MIBK)	µg/kg	NE	2800000	56 UJ	61 UJ	56 UJ	57 UJ
Acetone	µg/kg	NE	8800000	56 UJ	61 UJ	56 UJ	57 UJ
Benzene	µg/kg	NE	1400	5.6 U	6.1 U	5.6 U	5.7 U
Bromodichloromethane	µg/kg	NE	1400	5.6 U	6.1 U	5.6 U	5.7 U
Bromoform	µg/kg	NE	240000	5.6 U	6.1 U	5.6 U	5.7 U
Bromomethane	µg/kg	NE	23000	5.6 U	6.1 U	5.6 U	5.7 U
Carbon tetrachloride	µg/kg	NE	500	5.6 U	6.1 U	5.6 U	5.7 U
Chlorobenzene	µg/kg	NE	220000	5.6 U	6.1 U	5.6 U	5.7 U
Chloroethane	µg/kg	NE	NE	5.6 U	6.1 U	5.6 U	5.7 U
Chloroform	µg/kg	NE	530	5.6 U	6.1 U	5.6 U	5.7 U
Chloromethane	µg/kg	NE	2600	5.6 U	6.1 U	5.6 U	5.7 U
cis-1,2-Dichloroethene	µg/kg	NE	100000	5.6 U	6.1 U	5.6 U	5.7 U
cis-1,3-Dichloropropene	µg/kg	NE	550	5.6 U	6.1 U	5.6 U	5.7 U
Dibromochloromethane	µg/kg	NE	23000	5.6 U	6.1 U	5.6 U	5.7 U
Ethylbenzene	µg/kg	NE	230000	5.6 U	6.1 U	5.6 U	5.7 U
Methyl tert-butyl ether (MTBE)	µg/kg	NE	NE	11 U	12 U	11 U	11 U



**Table 4-2****Confirmation Soil Sample Analytical Results -TAA 765**

OHM Sample Number				18609-715	18609-716	18609-717	18609-718
Sample Location				TAA765-SBD	TAA765-SBD	TAA765-SBE	TAA765-SBE
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0
	Unit	Background	PRG				
Methylene chloride	µg/kg	NE	18000	5.6 U	6.1 U	5.6 U	5.7 U
Styrene	µg/kg	NE	680000	5.6 U	6.1 U	5.6 U	5.7 U
Tetrachloroethene	µg/kg	NE	17000	5.6 U	6.1 U	5.6 U	5.7 U
Toluene	µg/kg	NE	880000	5.6 U	6.1 U	5.6 U	5.7 U
trans-1,2-Dichloroethene	µg/kg	NE	270000	5.6 U	6.1 U	5.6 U	5.7 U
trans-1,3-Dichloropropene	µg/kg	NE	550	5.6 U	6.1 U	5.6 U	5.7 U
Trichloroethene	µg/kg	NE	7000	5.6 U	6.1 U	5.6 U	5.7 U
Vinyl acetate	µg/kg	NE	2500000	11 UJ	12 UJ	11 UJ	11 UJ
Vinyl Chloride	µg/kg	NE	35	5.6 U	6.1 U	5.6 U	5.7 U
Xylenes (total)	µg/kg	NE	320000	17 U	18 U	17 U	17 U
<b>EPA 8270B</b>							
1,2,4-Trichlorobenzene	µg/kg	NE	5500000	370 U	NA	370 U	NA
1,2-Dichlorobenzene	µg/kg	NE	700000	370 U	NA	370 U	NA
1,3-Dichlorobenzene	µg/kg	NE	860000	370 U	NA	370 U	NA
1,4-Dichlorobenzene	µg/kg	NE	8500	370 U	NA	370 U	NA
2,4,5-Trichlorophenol	µg/kg	NE	68000000	370 U	NA	370 U	NA
2,4,6-Trichlorophenol	µg/kg	NE	170000	370 U	NA	370 U	NA
2,4-Dichlorophenol	µg/kg	NE	2000000	370 U	NA	370 U	NA
2,4-Dimethylphenol	µg/kg	NE	14000000	370 U	NA	370 U	NA
2,4-Dinitrophenol	µg/kg	NE	1400000	930 U	NA	930 U	NA
2,4-Dinitrotoluene	µg/kg	NE	1400000	370 U	NA	370 U	NA
2,6-Dinitrotoluene	µg/kg	NE	680000	370 U	NA	370 U	NA
2-Chloronaphthalene	µg/kg	NE	110000	370 U	NA	370 U	NA
2-Chlorophenol	µg/kg	NE	370000	370 U	NA	370 U	NA
2-Methyl-4,6-dinitrophenol	µg/kg	NE	NE	930 U	NA	930 U	NA
2-Methylnaphthalene	µg/kg	NE	NE	370 U	NA	370 U	NA
2-Methylphenol	µg/kg	NE	34000000	370 U	NA	370 U	NA
2-Nitroaniline	µg/kg	NE	41000	370 U	NA	370 U	NA
2-Nitrophenol	µg/kg	NE	NE	370 U	NA	370 U	NA
3,3'-Dichlorobenzidine	µg/kg	NE	4200	370 U	NA	370 U	NA

**Table 4-2****Confirmation Soil Sample Analytical Results -TAA 765**

OHM Sample Number				18609-715	18609-716	18609-717	18609-718
Sample Location				TAA765-SBD	TAA765-SBD	TAA765-SBE	TAA765-SBE
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0
	Unit	Background	PRG				
3-Methyl-4-chlorophenol	µg/kg	NE	NE	370 U	NA	370 U	NA
3-Nitroaniline	µg/kg	NE	NE	370 U	NA	370 U	NA
4-Bromophenyl phenyl ether	µg/kg	NE	NE	370 U	NA	370 U	NA
4-Chloroaniline	µg/kg	NE	2700000	370 U	NA	370 U	NA
4-Chlorophenyl phenyl ether	µg/kg	NE	NE	370 U	NA	370 U	NA
4-Methylphenol	µg/kg	NE	3400000	370 U	NA	370 U	NA
4-Nitroaniline	µg/kg	NE	NE	370 U	NA	370 U	NA
4-Nitrophenol	µg/kg	NE	NE	930 U	NA	930 U	NA
Acenaphthene	µg/kg	NE	110000	370 U	NA	370 U	NA
Acenaphthylene	µg/kg	NE	NE	370 U	NA	370 U	NA
Anthracene	µg/kg	NE	5700	370 U	NA	370 U	NA
Benzo[a]anthracene	µg/kg	NE	2600	370 U	NA	370 U	NA
Benzo[a]pyrene	µg/kg	NE	260	37 U	NA	37 U	NA
Benzo[b]fluoranthene	µg/kg	NE	2600	370 U	NA	370 U	NA
Benzo[ghi]perylene	µg/kg	NE	NE	370 U	NA	370 U	NA
Benzo[k]fluoranthene	µg/kg	NE	26000	370 U	NA	370 U	NA
Bis (2-chloroethoxy)methane	µg/kg	NE	NE	370 U	NA	370 U	NA
Bis (2-chloroethyl)ether	µg/kg	NE	97	37 U	NA	37 U	NA
Bis (2-chloroisopropyl)ether	µg/kg	NE	27000	370 U	NA	370 U	NA
Bis (2-ethylhexyl)phthalate	µg/kg	NE	140000	370 U	NA	370 U	NA
Butyl benzyl phthalate	µg/kg	NE	930000	370 U	NA	370 U	NA
Chrysene	µg/kg	NE	7200	370 U	NA	370 U	NA
Di-n-butyl phthalate	µg/kg	NE	68000000	370 U	NA	370 U	NA
Di-n-octyl phthalate	µg/kg	NE	10000000	370 U	NA	370 U	NA
Dibenz[a,h]anthracene	µg/kg	NE	260	37 U	NA	37 U	NA
Dibenzofuran	µg/kg	NE	140000	370 U	NA	370 U	NA
Diethyl phthalate	µg/kg	NE	100000000	370 U	NA	370 U	NA
Dimethyl phthalate	µg/kg	NE	100000000	370 U	NA	370 U	NA
Fluoranthene	µg/kg	NE	27000000	370 U	NA	370 U	NA
Fluorene	µg/kg	NE	90000	370 U	NA	370 U	NA

**Table 4-2****Confirmation Soil Sample Analytical Results -TAA 765**

OHM Sample Number				18609-715	18609-716	18609-717	18609-718
Sample Location				TAA765-SBD	TAA765-SBD	TAA765-SBE	TAA765-SBE
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0
	Unit	Background	PRG				
Hexachlorobenzene	µg/kg	NE	1200	370 U	NA	370 U	NA
Hexachlorobutadiene	µg/kg	NE	24000	370 U	NA	370 U	NA
Hexachlorocyclopentadiene	µg/kg	NE	4600000	370 U	NA	370 U	NA
Hexachloroethane	µg/kg	NE	140000	370 U	NA	370 U	NA
Indeno[1,2,3-cd]pyrene	µg/kg	NE	2600	370 U	NA	370 U	NA
N-Nitrosodi-n-propylamine	µg/kg	NE	270	37 U	NA	37 U	NA
N-Nitrosodiphenylamine	µg/kg	NE	390000	370 U	NA	370 U	NA
Naphthalene	µg/kg	NE	240000	370 U	NA	370 U	NA
Nitrobenzene	µg/kg	NE	94000	370 U	NA	370 U	NA
Pentachlorophenol	µg/kg	NE	7900	740 U	NA	740 U	NA
Phenanthrene	µg/kg	NE	NE	370 U	NA	370 U	NA
Phenol	µg/kg	NE	100000000	370 U	NA	370 U	NA
Pyrene	µg/kg	NE	100000	370 U	NA	370 U	NA
<b>EPA 6010A</b>							
Aluminum	mg/kg	18600	100000	11000	NA	9700	NA
Antimony	mg/kg	4.5	680	5.6 U B	NA	5.6 U B	NA
Barium	mg/kg	220	100000	130	NA	150	NA
Beryllium	mg/kg	0.893	1.1	0.56	NA	0.48	NA
Cadmium	mg/kg	11.4	850	0.56 U	NA	0.56 U	NA
Calcium	mg/kg	67600	NE	4300	NA	7100	NA
Chromium	mg/kg	39.6	450	12	NA	9.4	NA
Cobalt	mg/kg	7.96	97000	6.7	NA	5.8	NA
Copper	mg/kg	37.9	63000	7.3	NA	6.3	NA
Iron	mg/kg	19000	NE	18000	NA	16000	NA
Magnesium	mg/kg	11100	NE	6400	NA	6200	NA
Manganese	mg/kg	574	43000	260	NA	220	NA
Molybdenum	mg/kg	NE	8500	2.2 U	NA	2.2 U	NA
Nickel	mg/kg	71.1	34000	8.9	NA	6.1	NA
Potassium	mg/kg	5560	NE	4900	NA	3700	NA
Silver	mg/kg	0.65	8500	1.1 U B	NA	1.1 U B	NA

**Table 4-2****Confirmation Soil Sample Analytical Results -TAA 765**

OHM Sample Number				18609-715	18609-716	18609-717	18609-718
Sample Location				TAA765-SBD	TAA765-SBD	TAA765-SBE	TAA765-SBE
Date Collected				10/21/97	10/21/97	10/21/97	10/21/97
Sample Depth (feet below ground surface)				1.5	3.0	1.5	3.0
	Unit	Background	PRG				
Sodium	mg/kg	483	NE	180	NA	220	NA
Thallium	mg/kg	0.53	120	3.8 J B	NA	4.5 J B	NA
Vanadium	mg/kg	102	12000	35	NA	30	NA
Zinc	mg/kg	104	100000	54	NA	47	NA
<b>EPA 7060A</b>							
Arsenic	mg/kg	8.5	2.4	1.00	NA	2.0	NA
<b>EPA 7421</b>							
Lead	mg/kg	22.9	1000	1.9	NA	1.8	NA
<b>EPA 7471A</b>							
Mercury	mg/kg	0.41	NE	0.09 U	NA	0.09 U	NA
<b>EPA 7740</b>							
Selenium	mg/kg	0.37	8500	0.56 U B	NA	0.56 U B	NA
<b>EPA 9045</b>							
pH	pH units	NE	NE	8.0	NA	8.2	NA

**Table 4-2**  
**Confirmation Soil Sample Analytical Results -TAA 765**

Explanation:

B - result exceeds background

CA LUFT - California Leaking Underground Fuel Tank

EPA - United States Environmental Protection Agency

J - estimated

M - Modified

MDL - method detection limit

mg/kg - milligrams per kilogram

NA - not analyzed

NE - not established

OHM - OHM Remediation Services Corp.

P - result exceeds industrial PRG

TPH - total petroleum hydrocarbons

U - not detected above or equal to the stated reporting limit

UST - underground storage tank

X - MDL = 1100

Y - MDL = 47

µg/kg - micrograms per kilogram

**Table 4-3****Source Water and Decontamination Sample Analytical Results - TAA 765**

OHM Sample Number		18609-743	18609-753
Sample Location		Source Blank	TAA765-Rinse
Date Collected		10/30/97	11/03/97
Sample Depth (feet below ground surface)		0.0	0.0
		Unit	
<b>CA LUFT 8015M</b>			
TPH as Diesel	mg/L	0.5 U	0.5 U
TPH as Gasoline	mg/L	0.1 U	0.1 U
TPH as JP-5	mg/L	0.5 U	0.5 U
<b>EPA 8081</b>			
4,4'-DDD	µg/L	0.03 U	0.03 U
4,4'-DDE	µg/L	0.03 U	0.03 U
4,4'-DDT	µg/L	0.05 U	0.05 U
Aldrin	µg/L	0.03 U	0.03 U
alpha-BHC	µg/L	0.03 U	0.03 U
alpha-Chlordane	µg/L	0.03 U	0.03 U
Aroclor-1016	µg/L	1 U	1 UJ
Aroclor-1221	µg/L	1 U	1 U
Aroclor-1232	µg/L	1 U	1 U
Aroclor-1242	µg/L	1 U	1 U
Aroclor-1248	µg/L	1 U	1 U
Aroclor-1254	µg/L	1 U	1 U
Aroclor-1260	µg/L	1 U	1 UJ
Beta-BHC	µg/L	0.03 U	0.03 U
Delta-BHC	µg/L	0.03 U	0.03 UJ
Dieldrin	µg/L	0.03 U	0.03 UJ
Endosulfan I	µg/L	0.03 U	0.03 U
Endosulfan II	µg/L	0.03 U	0.03 U
Endosulfan sulfate	µg/L	0.05 U	0.05 U
Endrin	µg/L	0.03 U	0.03 UJ
Endrin aldehyde	µg/L	0.03 U	0.03 UJ
Endrin ketone	µg/L	0.13 P	0.05 U
gamma-BHC	µg/L	0.03 U	0.03 U
gamma-Chlordane	µg/L	0.03 U	0.03 U
Heptachlor	µg/L	0.03 U	0.03 U

**Table 4-3****Source Water and Decontamination Sample Analytical Results - TAA 765**

OHM Sample Number		18609-743	18609-753
Sample Location		Source Blank	TAA765-Rinse
Date Collected		10/30/97	11/03/97
Sample Depth (feet below ground surface)		0.0	0.0
	Unit		
Heptachlor epoxide	µg/L	0.03 U	0.03 U
Methoxychlor	µg/L	0.05 U	0.05 UJ
Toxaphene	µg/L	5 U	5 U
<b>EPA 8260A</b>			
1,1,1-Trichloroethane	µg/L	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	5 U
1,1,2-Trichloroethane	µg/L	5 U	5 U
1,1-Dichloroethane	µg/L	5 U	5 U
1,1-Dichloroethene	µg/L	5 U	5 U
1,2-Dichloroethane	µg/L	5 U	5 U
1,2-Dichloropropane	µg/L	5 U	5 U
2-Butanone (MEK)	µg/L	50 U	50 UJ
2-Chloroethyl vinyl ether	µg/L	50 U	50 U
2-Hexanone	µg/L	50 U	50 U
4-Methyl-2-pentanone (MIBK)	µg/L	50 U	50 UJ
Acetone	µg/L	50 U	50 UJ
Benzene	µg/L	5 U	5 U
Bromodichloromethane	µg/L	5 U	0.77 J
Bromoform	µg/L	5 U	5 U
Bromomethane	µg/L	5 U	5 U
Carbon disulfide	µg/L	5 U	5 U
Carbon tetrachloride	µg/L	5 U	5 U
Chlorobenzene	µg/L	5 U	5 U
Chloroethane	µg/L	5 U	5 U
Chloroform	µg/L	5 U	0.74 J
Chloromethane	µg/L	5 U	5 U
cis-1,2-Dichloroethene	µg/L	5 U	5 U
cis-1,3-Dichloropropene	µg/L	5 U	5 U
Dibromochloromethane	µg/L	5 U	0.59 J
Ethylbenzene	µg/L	5 U	5 U

**Table 4-3****Source Water and Decontamination Sample Analytical Results - TAA 765**

OHM Sample Number		18609-743	18609-753
Sample Location		Source Blank	TAA765-Rinse
Date Collected		10/30/97	11/03/97
Sample Depth (feet below ground surface)		0.0	0.0
	Unit		
Methyl tert-butyl ether (MTBE)	µg/L	10 U	10 U
Methylene chloride	µg/L	5 U	5 U
Styrene	µg/L	5 U	5 U
Tetrachloroethene	µg/L	5 U	5 U
Toluene	µg/L	5 U	5 U
trans-1,2-Dichloroethene	µg/L	5 U	5 U
trans-1,3-Dichloropropene	µg/L	5 U	5 U
Trichloroethene	µg/L	5 U	5 U
Vinyl acetate	µg/L	50 U	50 U
Vinyl Chloride	µg/L	5 U	5 U
Xylenes (total)	µg/L	15 U	15 U
<b>EPA 8270B</b>			
1,2,4-Trichlorobenzene	µg/L	10 U	10 U
1,2-Dichlorobenzene	µg/L	10 U	10 U
1,3-Dichlorobenzene	µg/L	10 U	10 U
1,4-Dichlorobenzene	µg/L	10 U	10 U
2,4,5-Trichlorophenol	µg/L	10 U	10 U
2,4,6-Trichlorophenol	µg/L	10 U	10 U
2,4-Dichlorophenol	µg/L	10 U	10 U
2,4-Dimethylphenol	µg/L	10 U	10 U
2,4-Dinitrophenol	µg/L	25 U	25 U
2,4-Dinitrotoluene	µg/L	10 U	10 U
2,6-Dinitrotoluene	µg/L	10 U	10 U
2-Chloronaphthalene	µg/L	10 U	10 U
2-Chlorophenol	µg/L	10 U	10 U
2-Methyl-4,6-dinitrophenol	µg/L	25 U	25 U
2-Methylnaphthalene	µg/L	10 U	10 U
2-Methylphenol	µg/L	10 U	10 U
2-Nitroaniline	µg/L	10 U	10 U
2-Nitrophenol	µg/L	10 U	10 U



**Table 4-3**  
**Source Water and Decontamination Sample Analytical Results - TAA 765**

OHM Sample Number		18609-743	18609-753
Sample Location		Source Blank	TAA765-Rinse
Date Collected		10/30/97	11/03/97
Sample Depth (feet below ground surface)		0.0	0.0
	Unit		
3,3'-Dichlorobenzidine	µg/L	10 U	10 U
3-Methyl-4-chlorophenol	µg/L	10 U	10 U
3-Nitroaniline	µg/L	10 U	10 U
4-Bromophenyl phenyl ether	µg/L	10 U	10 U
4-Chloroaniline	µg/L	10 U	10 U
4-Chlorophenyl Phenyl Ether	µg/L	10 U	10 U
4-Methylphenol	µg/L	10 U	10 U
4-Nitroaniline	µg/L	10 U	10 U
4-Nitrophenol	µg/L	25 U	25 UJ
Acenaphthene	µg/L	10 U	10 U
Acenaphthylene	µg/L	10 U	10 U
Anthracene	µg/L	10 U	10 U
Benzo[a]anthracene	µg/L	10 U	10 U
Benzo[a]pyrene	µg/L	10 U	10 U
Benzo[b]fluoranthene	µg/L	10 U	10 U
Benzo[ghi]perylene	µg/L	10 U	10 U
Benzo[k]fluoranthene	µg/L	10 U	10 U
Bis (2-chloroethoxy)methane	µg/L	10 U	10 U
Bis (2-chloroethyl)ether	µg/L	10 U	10 U
Bis (2-chloroisopropyl)ether	µg/L	10 U	10 U
Bis (2-ethylhexyl)phthalate	µg/L	3.8 J	7.10 J
Butyl Benzyl Phthalate	µg/L	10 U	10 U
Chrysene	µg/L	10 U	10 U
Di-n-butyl phthalate	µg/L	10 U	10 U
Di-n-octyl phthalate	µg/L	10 U	10 U
Dibenz[a,h]anthracene	µg/L	10 U	10 U
Dibenzofuran	µg/L	10 U	10 U
Diethyl phthalate	µg/L	10 U	10 U
Dimethyl phthalate	µg/L	10 U	10 U
Fluoranthene	µg/L	10 U	10 U

**Table 4-3**  
**Source Water and Decontamination Sample Analytical Results - TAA 765**

OHM Sample Number		18609-743	18609-753
Sample Location		Source Blank	TAA765-Rinse
Date Collected		10/30/97	11/03/97
Sample Depth (feet below ground surface)		0.0	0.0
	Unit		
Fluorene	µg/L	10 U	10 U
Hexachlorobenzene	µg/L	10 U	10 U
Hexachlorobutadiene	µg/L	10 U	10 U
Hexachlorocyclopentadiene	µg/L	10 U	10 U
Hexachloroethane	µg/L	10 U	10 U
Indeno[1,2,3-cd]pyrene	µg/L	10 U	10 U
N-Nitrosodi-n-propylamine	µg/L	10 U	10 U
N-Nitrosodiphenylamine	µg/L	10 U	10 U
Naphthalene	µg/L	10 U	10 U
Nitrobenzene	µg/L	10 U	10 U
Pentachlorophenol	µg/L	20 U	20 U
Phenanthrene	µg/L	10 U	10 U
Phenol	µg/L	10 U	10 U
Pyrene	µg/L	10 U	10 U
<b>EPA 6010A</b>			
Aluminum	µg/L	170 J	99 J
Antimony	µg/L	500 U	500 U
Barium	µg/L	93 J	87 J
Beryllium	µg/L	10 U	10 U
Cadmium	µg/L	5 U	2.2 J
Calcium	µg/L	66000	64000
Chromium	µg/L	50 U	6.1 J
Cobalt	µg/L	50 U	50 U
Copper	µg/L	11 J	11 J
Iron	µg/L	550	530
Magnesium	µg/L	26000	25000
Manganese	µg/L	10 J	17 J
Molybdenum	µg/L	100 U	100 U
Nickel	µg/L	150 U	150 U
Potassium	µg/L	4100 J	4800 J

**Table 4-3**  
**Source Water and Decontamination Sample Analytical Results - TAA 765**

OHM Sample Number		18609-743	18609-753
Sample Location		Source Blank	TAA765-Rinse
Date Collected		10/30/97	11/03/97
Sample Depth (feet below ground surface)		0.0	0.0
	Unit		
Silver	µg/L	50 U	50 U
Sodium	µg/L	91000	92000
Thallium	µg/L	400 U	26 J
Vanadium	µg/L	100 U	100 U
Zinc	µg/L	38	23
<b>EPA 7060A</b>			
Arsenic	µg/L	2.5 J	2.5 J
<b>EPA 7421</b>			
Lead	µg/L	5 U	5 U
<b>EPA 7470A</b>			
Mercury	µg/L	0.2 U	0.2 U
<b>EPA 7740</b>			
Selenium	µg/L	5 U	5 U
<b>EPA 9010A</b>			
Cyanide	mg/L	0.02 U	0.02 U
<b>EPA 150.1 / 9040</b>			
pH	pH units	8.0	8.5

**Table 4-3**  
**Source Water and Decontamination Sample Analytical Results -TAA 765**

Explanation:

B - result exceeds background

CA LUFT - California Leaking Underground Fuel Tank

EPA - United States Environmental Protection Agency

J - estimated

M - Modified

MDL - method detection limit

mg/L - milligrams per liter

NA - not analyzed

NE - not established

OHM - OHM Remediation Services Corp.

P - result exceeds industrial PRG

TPH - total petroleum hydrocarbons

U - not detected above or equal to the stated reporting limit

UST - underground storage tank

X - MDL = 1100

Y - MDL = 47

µg/L - micrograms per liter

**Table 4- 4**  
**Source Water Blank Range Compared to TAA 765 Rinsate Water**

Detected Parameter	Unit	Souce Blank Range		Frequency of Detection (detections/samples analyzed)	TAA 765 Rinsate
		Minimum	Maximum		
Bromodichloromethane	µg/L	<5	9.6	2/3	0.77
Chloroform	µg/L	<5	9.1	2/3	0.74
Dibromochloromethane	µg/L	<5	6.5	2/3	0.59
Aluminum	µg/L	110	170	3/3	99
Arsenic	µg/L	<5	2.5	2/3	2.5
Barium	µg/L	89	95	3/3	87
Cadmium	µg/L	<5	2	1/3	2.2
Chromium	µg/L	<50	6.9	1/3	6.1
Copper	µg/L	7.2	11	3/3	11
Manganese	µg/L	10	18	3/3	17
Thallium	µg/L	<400	34	1/3	26
Zinc	µg/L	23	42	3/3	23

**TABLE 6-1**  
**Industrial Risk Screening Worksheet for Soil**  
**TAA 765**  
**Marine Corps Air Station, El Toro**

Detected Chemical	Maximum Soil Concentration (mg/kg)	Background Concentration (mg/kg)	CANCER			NON-CANCER		
			PRG <sup>a</sup> (mg/kg)	Maximum Ratio	Background Ratio <sup>b</sup>	PRG <sup>c</sup> (mg/kg)	Maximum Ratio	Background Ratio <sup>b</sup>
METALS								
Aluminum	11,000	18,600	NE	NE	NE	1.0E+05	1.10E-01	1.10E-01
Arsenic	2	8.5	2.4E+00	8.33E-01	8.33E-01	3.8E+02	5.26E-03	5.26E-03
Barium	180	220	NE	NE	NE	1.1E+05	1.64E-03	1.64E-03
Beryllium	0.56	0.893	1.1E+00	5.09E-01	5.09E-01	8.5E+03	6.59E-05	6.59E-05
Chromium	12	39.6	NE	NE	NE	1.0E+05	1.20E-04	1.20E-04
Cobalt	6.7	7.96	NE	NE	NE	9.7E+04	6.91E-05	6.91E-05
Copper	7.3	37.9	NE	NE	NE	6.3E+04	1.16E-04	1.16E-04
Lead	2	22.9	NE	NE	NE	1.0E+03	2.00E-03	2.00E-03
Manganese	260	574	NE	NE	NE	4.3E+04	6.05E-03	6.05E-03
Nickel	8.9	71.1	3.1E+02	2.87E-02	2.87E-02	3.4E+04	2.62E-04	2.62E-04
Thallium	4.5	0.53	NE	NE	NE	1.2E+02	3.75E-02	4.42E-03
Vanadium	35	102	NE	NE	NE	1.2E+04	2.92E-03	2.92E-03
Zinc	54	104	NE	NE	NE	1.0E+05	5.40E-04	5.40E-04
Subtotal sum of ratios			1.34E+00		1.34E+00		1.67E-01	1.33E-01
Organics								
Bis(2-ethylhexyl)phthalate	0.12	NE	7.9E+00	1.52E-02	NE	1.4E+04	8.57E-06	NE
Subtotal sum of ratios			1.52E-02		NE		8.57E-06	NE
SUM OF RATIOS			1.36E+00		1.34E+00		1.67E-01	1.33E-01
SUM OF MAXIMUM RATIOS MINUS BACKGROUND			CANCER RISK 1.52E-02			3.31E-02		
SITE RELATED			CANCER RISK 1.5x10 <sup>-8</sup>			NON-CANCER HAZARD INDEX 0.03		

<sup>a</sup>Industrial soil PRG for cancer from the EPA Region 9, 1 August 1996.

<sup>b</sup>Where the background concentration exceeds the maximum concentration the background ratio was defaulted to the maximum ratio.

<sup>c</sup>Industrial soil PRG for non-cancer from the EPA Region 9, 1 August 1996.

mg/kg - Milligrams per kilogram.

NE - No entry.

PRG - Preliminary remediation goal.

***Appendix A***  
***VSI Evaluation Report for TAA 765***

# ACCUMULATION AREA EVALUATION CHECKLIST

(CIRCLE AS APPROPRIATE AND FILL IN COMPLETELY)

JOE 22214  
NAVY CLEAN

CTD-0085

MCAS EL TORO RFA CONFIRMATION ACTIVITIES

## GENERAL DESCRIPTION:

SWMU #: 266

Accumulation Area (AA) #: 765

Location (bldg): Drum Storage Area/Bldg. 765

Site Contact: Leta Suarez

Ext: 2772

Permission for Access? ☒ Y ☐ N If yes, explain: N/A.

Type of Wastes Observed None

## TYPE: (CIRCLE AS APPROPRIATE)

☒ Locker

☒ Cabinet

☒ Pad

☒ Concrete/Soil/Asphalt floor

~~Berm~~

~~Fence~~

~~Fence Type:~~

~~Indoor~~

☒ Pallets

~~Drum(s)~~

~~No. of Drums:~~

☒ Outdoor

## CONDITION:

~~Stain(s)~~ ~~Odor(s)~~ ~~Crack(s)~~

Placards/Labels: ☒ Y ☐ N If Yes, list: Polyurethane Coating.

Observations: Roof over concrete pad and berm. Unlabeled cabinets and lockers.  
Pad is clean.

Status: Active as of 11-10-95.

## DIMENSIONS: (ESTIMATED SIZE OR AREA IN FT)

AA/SWMU: 10x20 ft.

"Stain(s)": None.

Any Restrictions To Access?: roof and poles.

## EVALUATION OF REMOVAL/DECONTAMINATION STRATEGY (CIRCLE AS APPROPRIATE)

Yes

☒ No

Potential for release evident based on this surveillance

☒ Yes

☐ No

Potential for simple removal

Yes

☒ No

Potential for decontamination activities prior to removal

Yes

☒ No

Potential for sampling (describe: )

Yes

☐ No

Potential for removal after additional assessment activities

**SKETCH:** (MAKE A SKETCH or ATTACH PHOTO(S) OF RELEVANT ACCESS, OBJECTS, WORK SPACE, ETC., AS APPROPRIATE, ON REVERSE OF THIS FORM)

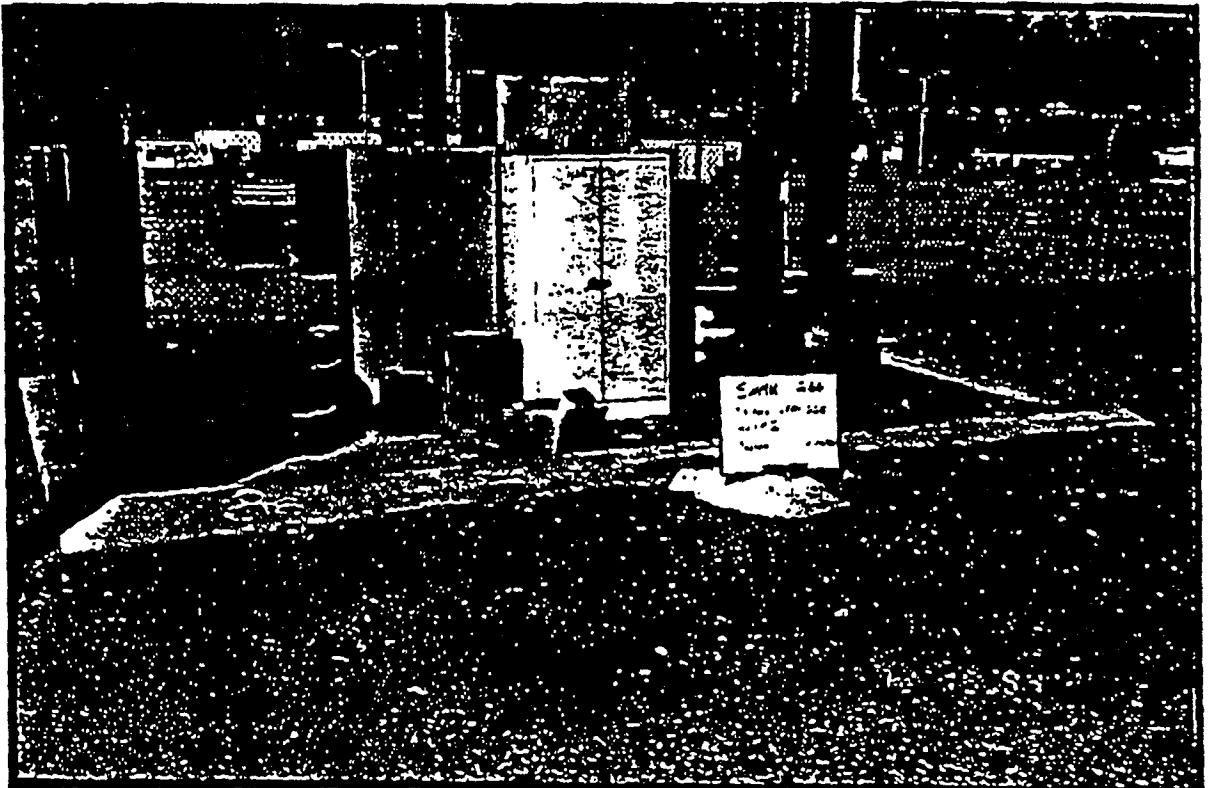
DATE/TIME OF SURVEILLANCE: 12-6-94/11:10

UPDATED: 11-10-95

SURVEILLANCE PERFORMED BY: Larry Bauman



## PHOTO LOG



**SWMU #: 266**

**PHOTO DATE: 12-14-94**

***Appendix B***  
***RFA Background Information***

**TABLE 4-1**  
**COMPREHENSIVE LIST OF SWMUs AND AREAS OF CONCERN**  
**IDENTIFIED DURING THE PRELIMINARY REVIEW/VISUAL SITE INSPECTION**  
**MCAS EL TORO RFA**

SWMU	SWMU TYPE	SOURCE (1)	LOCATION/BUILDING	COMMENTS	DATE	SIZE	MATERIAL	CONTENTS
61	Underground Storage Tank	f	205	Release detection 1989, Active	1943	25,000 gal	Steel-Lined Concrete	Waste JP-5
62	Underground Storage Tank	f	206	Release detection 1989, Active	1943	50,000 gal	Steel-Lined Concrete	Waste JP-5
63	Underground Storage Tank	f	207	Release detection 1989, Active	1943	50,000 gal	Steel-Lined Concrete	Waste JP-5
64	Hazardous Waste Storage Area	Active	240					
65	Underground Storage Tank	f	240	Active	1982	185 gal	Steel	Waste Oil
66	Oil/Water Separator	f	240	Active	1982	100 gal	Steel	
67	Drum Storage Area	b	242					
68	Oil/Water Separator (2)	f	244	Active	1944	100 gal	Concrete	
69	Drum Storage Area (2)	a	262					
70	Hazardous Waste Storage Area	Active	289					
71	Hazardous Waste Storage Area	Active, b	295	RI/FS Site				
72	Hazardous Waste Storage Area	Active	296					
73	Hazardous Waste Storage Area	Active, a	297					
74	Aircraft Wash Area	a	297					
75	Underground Storage Tank	f	297	Active	1988	1,000 gal	Fiberglass-Coated Steel	Fuel Slop
76	Oil/Water Separator	f	297	Active	1982	100 gal	Steel	
77	Underground Storage Tank	f	297	Active	1982	185 gal	Steel	Waste Oil
78	Drum Storage Area (2)	c	297			720 sq ft		
79	Drum Storage Area (2)	c	297			50 sq ft		
80	Drum Storage Area (2)	c	297			16 sq ft		
81	Drum Storage Area (2)	c	297			352 sq ft		
82	Drum Storage Area (2)	c	297			450 sq ft		
83	Hazardous Waste Storage Area	Active, a, b	298					
84	Oil/Water Separator	f	298	Active	1982	100 gal	Steel	
85	Underground Storage Tank	f	298	Active	1982	185 gal	Steel	Waste Oil
86	Drum Storage Area	c	298	Possible duplicate of SWMU/AOC 83		25 sq ft		
87	Drum Storage Area	c	298	Possible duplicate of SWMU/AOC 83		120 sq ft		
88	Drum Storage Area	e	306					
89	Drum Storage Area (2)	c	306			60 sq ft		
90	Former Sewage Treatment Plant	e	307					

TABLE 4-1  
COMPREHENSIVE LIST OF SWMUs AND AREAS OF CONCERN  
IDENTIFIED DURING THE PRELIMINARY REVIEW/VISUAL SITE INSPECTION  
MCAS EL TORO RFA

SWMU	SWMU TYPE	SOURCE (1)	LOCATION/BUILDING	COMMENTS	DATE	SIZE	MATERIAL	CONTENTS
241	Drum Storage Area	k	155					
242	Hazardous Waste Storage Area	k	371					
243	Washrack	k	96					
244	PCB Spill Area	i	457					
245	Golf Course	i	464					
246	Golf Course Irrigation Tank	i	459					
247	Pipe Line	i	See Figure 1-2 of PRVSI	From Sewage treatment plant to irrigation tank				
248	Oil/Water Separator	k	463					
249	Underground Storage Tank	k	463					
250	Underground Storage Tank	k	655					
251	Drum Storage Area	k	388					
252	Hazardous Waste Storage Area	k	398					
253	Vehicle Washrack	k	317					
254	Drum Storage Area	k	359					
255	Hazardous Waste Storage Area	k	606					
256	Hazardous Waste Storage Area	k	441					
257	Wash Water Runoff Site	k	575					
258	Wash Water Runoff Site	k	577					
259	Drum Storage Area	k	389					
260	Aboveground Storage Tank	k	389					
261	Drum Storage Area	k	390					
262	Fuel Storage Area	k	390					
263	Underground Storage Tank	k	374					
264	Equipment Storage Area	k	DRMO LOT #3					
265	Metal Plating Sewer Lines	i	See Figure 1-2 of PRVSI					
266	Drum Storage Area	k	765					
267	Drop Tank Fuel Storage Area	k	605					
268	Vehicle Wash Rack	k	240					
269	Flammable Storage Locker	k	314					
270	Washrack	k	817					

***Appendix C***  
***Draft Final Phase II RI Report for Site 13***

Southwest Division  
Naval Facilities Engineering Command  
Contracts Department  
1220 Pacific Highway, Room 135  
San Diego, California 92132-5187

Contract No. N68711-92-D-4670

**COMPREHENSIVE LONG-TERM ENVIRONMENTAL  
ACTION NAVY  
CLEAN II**

**DRAFT FINAL PHASE II  
REMEDIAL INVESTIGATION REPORT  
ATTACHMENT H  
OU-3A SITE 13, OIL CHANGE AREA  
MARINE CORPS AIR STATION  
EL TORO, CALIFORNIA  
CTO-0079/0364  
March 1997**

Prepared by:

BECHTEL NATIONAL, INC.  
401 West A Street, Suite 1000  
San Diego, California 92101



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## ACRONYMS/ABBREVIATIONS

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AOC	area of concern
BCT	Base Realignment and Closure (BRAC) Cleanup Team
bgs	below ground surface
BHC	hexachlorocyclohexane
Cal-EPA	California Environmental Protection Agency
CA LUFT/SW	California Leaking Underground Fuel Tank/Solid Waste
CAS	Chemical Abstract Service
CLP	(U.S. EPA) Contract Laboratory Program
COPC	chemical of potential concern
CSF	cancer slope factor
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethene
DDT	dichlorodiphenyltrichloroethane
DQO	data quality objective
HI	hazard index
K <sub>d</sub>	distribution coefficient
K <sub>oc</sub>	organic carbon-to-water partitioning coefficient
MCAS	Marine Corps Air Station
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
OLM	organic laboratory method
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PRG	preliminary remediation goal
RFA	Resource Conservation and Recovery Act (RCRA) Facilities Assessment
RfD	reference dose
RI	Remedial Investigation
SAIC	Science Applications International Corporation
SVOC	semivolatile organic compound
SWMU	solid waste management unit

## ACRONYMS/ABBREVIATIONS (continued)

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TAL	target analyte list
TDS	total dissolved solids
TIC	tentatively identified compound
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TRPH	total recoverable petroleum hydrocarbons
UCL	upper confidence limit
U.S. EPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

## Section 1 INTRODUCTION

---

This attachment presents the results of the Phase I Remedial Investigation (RI) performed for Marine Corps Air Station (MCAS) El Toro, Site 13, Oil Change Area. No Phase II RI samples were collected at this site. The discussion includes site-specific RI information and analyses.

The following information pertinent to the Site 13 investigation is included in this attachment:

- summary of the purpose and objectives of the RI, a general description and history of the site, and a summary of previous investigations (Section 1);
- summary of the Phase I work performed (Section 2);
- description of the physical characteristics of the site (Section 3);
- discussion of nature and extent of contamination using Phase I soil data (Section 4);
- fate-and-transport analysis for soil at the site (Section 5);
- baseline human-health risk analysis based on Phase I data (Section 6);
- summary of the RI, its conclusions, and a list of recommended actions (Section 7); and
- list of references (Section 8).

### 1.1 SITE BACKGROUND

This section provides a general description of Site 13 and summarizes the site history.

#### 1.1.1 Site Description

Site 13 encompasses about ~~threeone~~ three-quarters of an acre north of Building 242 in the northwest quadrant of MCAS El Toro (Figure 1-1). The site is bounded on the north by former Tank Farm No. 2 and by the storage yard for Building 242 to the south. The site consists of two units: ~~Unit 1, the~~ the area southeast of Tank Farm No. 2 (approximately 17,300 square feet), and ~~Unit 2, the~~ the area southwest of Tank Farm No. 2 (approximately 16,800 square feet) (Figure 1-2).

Site boundaries for MCAS El Toro Phase I RI were determined by consensus among the Navy and regulatory agencies before beginning the Phase I RI. The two units were grouped together based on common historical activities, aerial photograph review, and proximity. In August 1996, the Draft MCAS El Toro Community Reuse Plan was issued. According to this plan, Site 13 is located within an area designated for a Terminal Complex.

#### 1.1.2 History

Trucks were driven to the area southeast of the tank farm ~~Unit 1~~ for oil changes, and crank case oil was frequently drained onto the ground. This activity occurred throughout the area as evidenced by well-defined stains on the historical aerial photographs. It is estimated that from 1977 to 1983, approximately 7,000 gallons of waste oil were drained onto the ground. The oily soil was subsequently removed, and no visible evidence of the

oily soil remains. A review of aerial photographs also indicates heavy staining throughout the area between the tank farm and Building 242 of Unit 2 that persisted over the years of photographic record. It is likely that oil changes were also conducted in that area at Unit 2 (Jacobs Engineering 1993a).

## 1.2 PREVIOUS INVESTIGATIONS

The following sections summarize results from previous investigations at Site 13, including a Resource Conservation and Recovery Act (RCRA) Facilities Assessment (RFA), Phase I RI, aerial photographic surveys, and employee interviews.

### 1.2.1 RCRA Facilities Assessment

The RFA identified three solid waste management units (SWMUs)/areas of concern (AOCs) within the Site 13 boundaries: SWMU/AOC 67 (Drum Storage Area), SWMU/AOC 217 (Underground Storage Tank [UST]), and SWMU/AOC 218 (Oil/Water Separator). During the RFA, these areas were not sampled because they are within Site 13 boundaries, and investigation of these areas was deferred to the RI. All three SWMU/AOCs are located within the Unit 1 boundaries (Jacobs Engineering 1993b).

SWMU/AOCs 217 and 218 are being evaluated under the MCAS El Toro UST Investigation. SWMU/AOC 67 is still active, and it is anticipated that this SWMU will be evaluated under the MCAS El Toro RFA Closure Program.

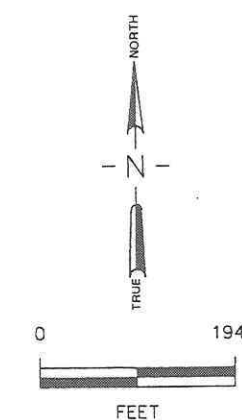
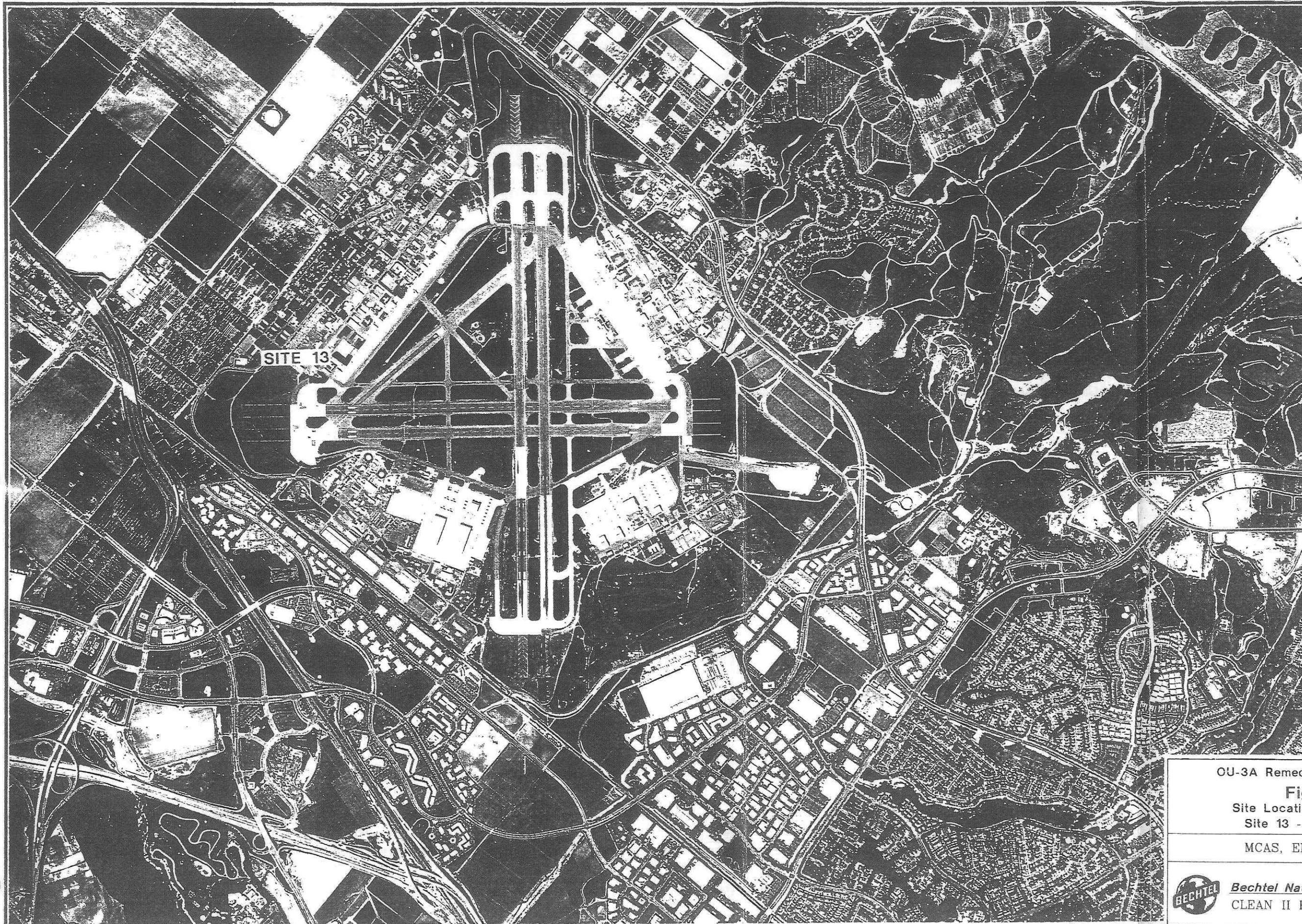
### 1.2.2 Phase I Remedial Investigation

The Phase I RI at Site 13 investigated two units (referred to as strata during Phase I): Unit 1, Area Southeast of Tank Farm, and Unit 2, Area Southwest of Tank Farm (Figure 1-2). The following site-specific activities were conducted.

- Shallow-soil samples (0 to 10 feet below ground surface [bgs]) were collected from five locations in ~~Unit~~Stratum 1, five locations in ~~Unit~~Stratum 2, and at two off-site upgradient locations.
- Deeper subsurface-soil samples were collected from one 25-foot boring in ~~Unit~~Stratum 2.
- Three other deep borings were drilled and sampled; one was completed as a downgradient monitoring well, one as an upgradient monitoring well, and the third as an on-site monitoring well.
- Groundwater samples were collected from the three monitoring wells.

Analytes reported in soil included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), diesel, gasoline, total recoverable petroleum hydrocarbons (TRPH), and metals. Analytes identified in groundwater included VOCs, SVOCs, petroleum hydrocarbons, metals, and general chemistry parameters (bicarbonate, chloride, nitrate/nitrite, and total dissolved solids [TDS]). A summary of sampling





SOURCE: AERIAL PHOTOBANK  
SAN DIEGO, CALIFORNIA  
MARCH 1995

OU-3A Remedial Investigation Report

Figure 1-1

Site Location Aerial Photograph  
Site 13 - Oil Change Area

MCAS, El Toro, California



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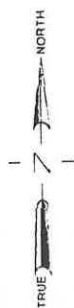
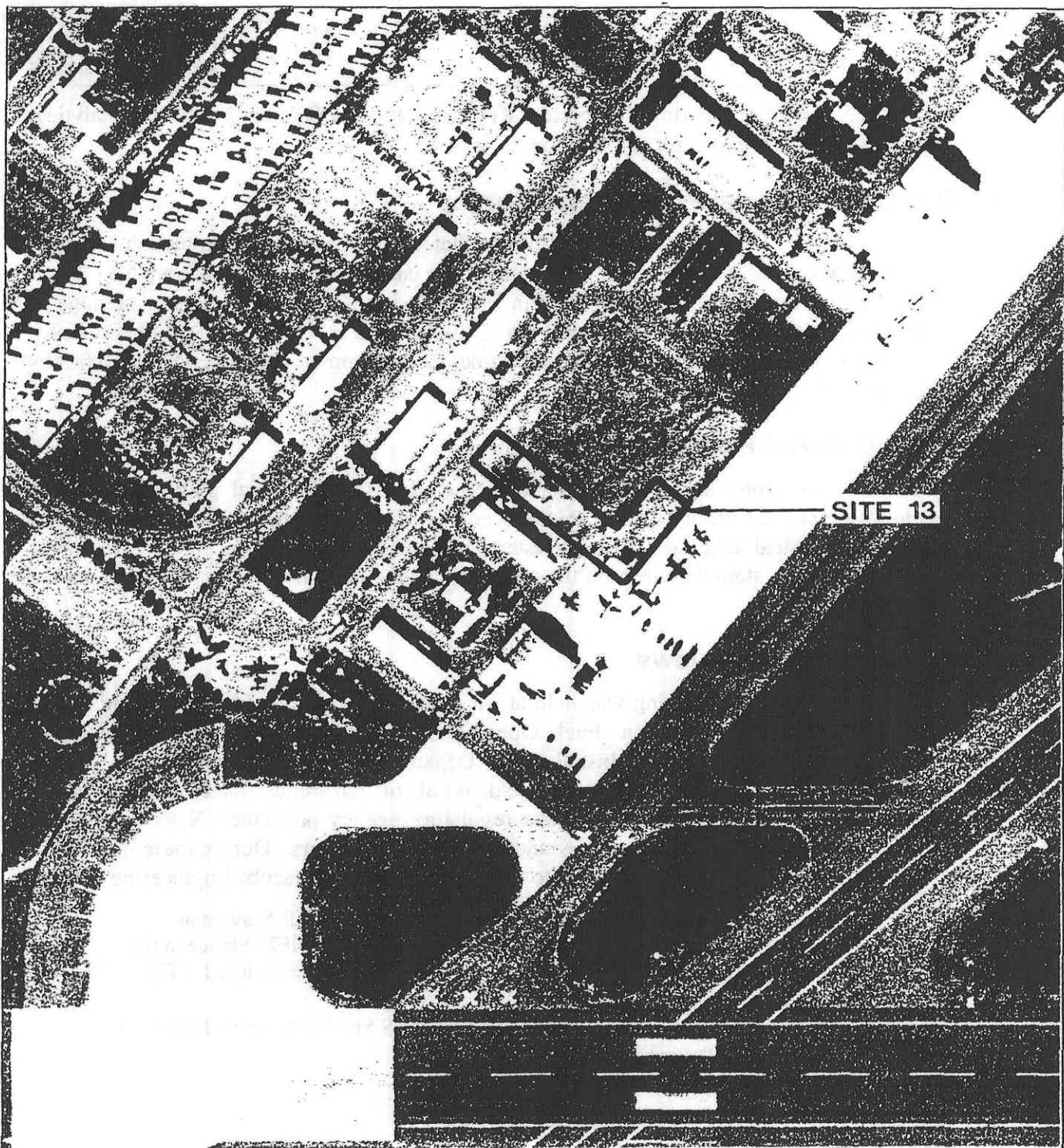
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SOURCE AERIAL PHOTOBANK INC.  
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DATE: 1/12/96

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Figure 1-2

Site Aerial Photograph (1/12/96)  
Site 13 - Oil Change Area

MCAS, El Toro, California



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File No:  
Job No: 22214-079  
Rev No: A

activities performed during the Phase I RI is presented in Section 2, and the analytical results of this sampling are discussed in Section 4.

### **1.2.3 U.S. EPA Aerial Photograph Survey**

In a survey conducted by the United States Environmental Protection Agency (U.S. EPA), a heavy stain was observed in the area between Tank Farm No. 2 and Building 242 on aerial photographs from 1952, 1965, and 1970. Also, heavy staining in the area south and east of Tank Farm No. 2 was evident in 1965 and 1970 photographs. Probable stains were identified in the same location on a 1980 photograph (Jacobs Engineering 1993a).

### **1.2.4 SAIC Aerial Photograph Survey**

The Science Applications International Corporation (SAIC) aerial photograph survey identified stained ground in the southern corner of the site on a 1967 photograph. A possible vertical tank in the southeastern portion of the site was noted on a 1971 photograph. A stain was seen on the north side of the tank in a 1971 photograph (SAIC 1993).

### **1.2.5 Employee Interviews**

On 26 May 1994, a meeting was held at MCAS El Toro to interview active and retired personnel from the Station Fuel Operations Division and Facility Management Department (currently the Installations Department) with knowledge of Station operations and procedures for storage/disposal of hazardous materials and waste. Interviewers included federal and state regulatory agency personnel, Navy and Station personnel, and personnel from Navy and U.S. EPA contractors. During these interviews, the following information pertaining to Site 13 was obtained (Jacobs Engineering 1994a).

- Tank Farm No. 2, located adjacent to Site 13, stored JP-4, JP-5, aviation gasoline, and waste oils. Tank Farm No. 2 was closed in 1987. Sludge in the tanks was pumped from the tanks soon after the tank farm was closed. (The tanks were removed in 1995.)
- The panel concurred with the boundaries of RI/FS Site 13 shown on Figure 3-1 of the Base Closure Plan.

## Section 2

# STUDY AREA INVESTIGATIONS

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This section describes the Phase I RI activities conducted at Site 13. A Phase II RI was not conducted at this site. The Base Realignment and Closure (BRAC) Cleanup Team (BCT) decided at its 21 August 1996 meeting to complete the RI for Site 13 utilizing the Phase I data. The results of the Phase I RI are presented in Section 4.

## 2.1 SOIL SAMPLING

During the Phase I investigation, 21 shallow-soil (0 to 10 feet bgs) samples and 10 deeper subsurface-soil (greater than 10 feet bgs) samples were collected from ten soil boring or monitoring well locations within Site 13 boundaries (Figure 2-1). Six soil samples were also collected from three off-site soil boring locations, two of which were converted to monitoring wells. Table 2-1 summarizes the Phase I sample locations and depths.

## 2.2 LABORATORY ANALYSES FOR SOIL

Table 2-2 presents the fixed-base laboratory analyses performed on the Phase I soil samples. The analyses are discussed in further detail by unit below. The Phase I RI off-site sample locations are included in Table 2-2 for completeness. However, they are located outside the Site 13 unit boundaries and will not be addressed in relation to risk at this site (Section 6). Therefore, the sample locations are not included in the discussion of unit-specific analyses presented in the following subsections, or in the discussions of analytical results (Section 4.2) or fate and transport (Section 5).

### 2.2.1 Unit 1, Area Southeast of Tank Farm

Phase I soil samples collected from Unit 1 were analyzed using a fixed-base laboratory for pesticides/polychlorinated biphenyls (PCBs) (U.S. EPA Contract Laboratory Program [CLP] Organic Laboratory Method [OLM] 01.5), SVOCs (U.S. EPA CLP OLM 01.5), target analyte list (TAL) metals (U.S. EPA Method 200 series), total petroleum hydrocarbons (TPH) (California Leaking Underground Fuel Tank/Solid Waste [CA LUFT/SW]), TRPH (U.S. EPA Method 418.1), total organic carbon (TOC) (U.S. EPA CLP), and VOCs (U.S. EPA CLP OLM 01.5).

### 2.2.2 Unit 2, Area Southwest of Tank Farm

Phase I soil samples collected from Unit 2 were analyzed using a fixed-base laboratory for SVOCs (U.S. EPA CLP OLM 01.5), TAL metals (U.S. EPA Method 200 series), TPH (CA LUFT/SW), TRPH (U.S. EPA Method 418.1), and VOCs (U.S. EPA CLP OLM 01.5).

## 2.3 LABORATORY ANALYSES FOR GROUNDWATER

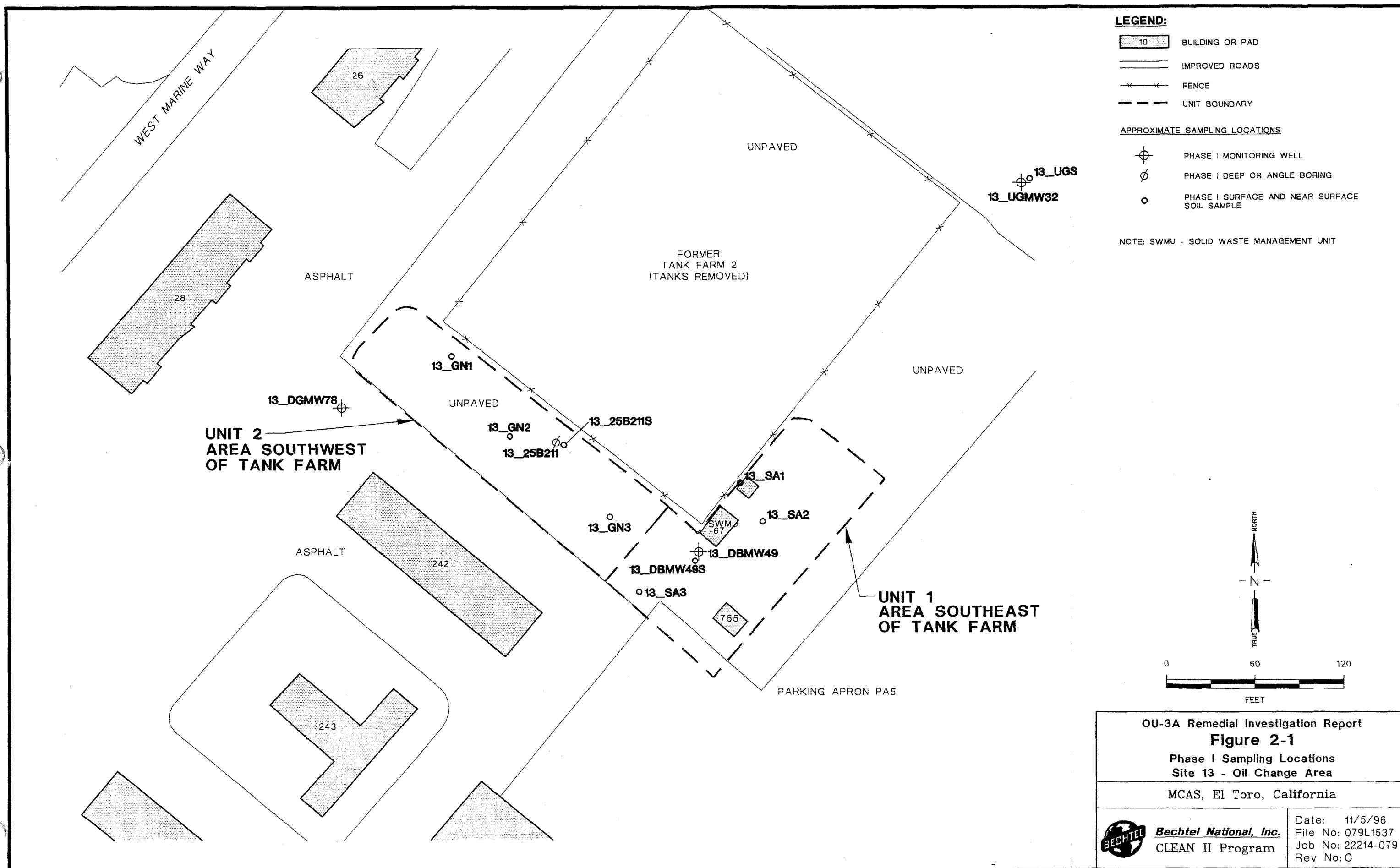
Phase I groundwater samples collected from the three Site 13 monitoring wells were analyzed using a fixed-base laboratory for general chemistry parameters, gross alpha and beta (U.S. EPA Method 9310), pesticides/PCBs (U.S. EPA CLP OLM 01.5), SVOCs

Section 2 Study Area Investigations

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(U.S. EPA CLP OLM 01.5), total cyanide (U.S. EPA CLP), TAL metals (U.S. EPA Method 200 series), TPH (CA LUFT/SW), TRPH (U.S. EPA Method 418.1), and VOCs (U.S. EPA CLP OLM 01.5). The general chemistry parameters included alkalinity, bicarbonate, and carbonate (U.S. EPA Method 310.1), chloride and sulfate (U.S. EPA Method 300.0), nitrate/nitrite (U.S. EPA Method 353.3), and TDS ~~total dissolved solids~~ (U.S. EPA Method 160.1).

The Site 13 wells were also sampled on two occasions following the Phase I RI, in 1993 and 1996. Results of these groundwater sample analyses are presented in the Installation Restoration Program RI/FS Groundwater Quality Data Report (Jacobs Engineering (1994b) and the Draft Quarterly Monitoring Report (CDM 1996).



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Section 2 Study Area Investigations

**Table 2-1**  
**Summary of Phase I Soil Borings**

Unit	Soil Boring	Phase I Sample Depth (feet bgs*)
1	13_DBMW49S	0
	13_DBMW49	5, 10, 15, 20, 25, 30, 80, 130, 147
	13_SA1	0, 2
	13_SA2	0, 2, 4
	13_SA3	0, 2, 4
2	13_25B211S	0
	13_25B211	5, 10, 15, 20, 25
	13_GN1	0, 2
	13_GN2	0, 2, 4
	13_GN3	0, 2
Off-site	13_UGS	0, 2
	13_UGMW32	5, 30
	13_DGMW78	120, 135

Note:

\* bgs – below ground surface

**Table 2-2**  
**Fixed-Base Analyses of Soil Samples**

Analyte	Unit 1 No. of Samples	Unit 2 No. of Samples <sup>a</sup>	Off-Site No. of Samples	Analytical Method
Pesticides/PCBs <sup>b</sup>	8	0	1	U.S. EPA <sup>c</sup> CLP <sup>d</sup> OLM <sup>e</sup> 01.5
Semivolatile organic compounds	17	13	3	U.S. EPA CLP OLM 01.5
Target analyte list metals	17	13	5	U.S. EPA Method 200 series
Total petroleum hydrocarbons	17	13	5	CA LUFT/SW <sup>f</sup>
Total recoverable petroleum hydrocarbons	17	13	5	U.S. EPA Method 418.1
Volatile organic compounds	17	13	4	U.S. EPA CLP OLM 01.5
Total organic carbon	1	0	1	
<b>Total Phase I Samples</b>	<b>18</b>	<b>13</b>	<b>6</b>	

Notes:

<sup>a</sup> includes one catch basin sediment sample

<sup>b</sup> PCB – polychlorinated biphenyl

<sup>c</sup> U.S. EPA – United States Environmental Protection Agency

<sup>d</sup> CLP – (U.S. EPA) Contract Laboratory Program

<sup>e</sup> OLM – organic laboratory method

<sup>f</sup> CA LUFT/SW – California Leaking Underground Fuel Tank/Solid Waste

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## Section 3

# PHYSICAL CHARACTERISTICS OF THE SITE

---

This section describes the site-specific physical characteristics of Site 13. The characteristics described in this section are used in the development of a site-specific conceptual model and in the development of potential contaminant pathways for the risk assessment. Stationwide physical characteristics are discussed in Section 3 of the main body of this report.

## 3.1 SURFACE FEATURES

Site 13 is located in the northwest quadrant of MCAS El Toro (Figure 3-1). The site is bounded by former Tank Farm No. 2 to the north, a parking apron (PA5) to the south and east, and an open asphalt area to the south and west. The two units in Site 13 have similar surface features. Both units are relatively flat, unpaved, and generally unvegetated. Unit 1 has small areas with weathered asphalt and spotty grass coverage. Unit 2 contains some small shrubs. There is no obvious surface drainage direction from the site; however, storm drains near Site 13 discharge into Bee Canyon Wash. This drainage is a potential pathway for movement of contaminated surface soils as suspended particulates and for dissolved-phase transport in surface-water runoff.

## 3.2 SOILS

Based on a review of shallow-soil sample data from the Phase I RI boring logs, the soil at Site 13 consists of moderately to well-graded clayey to silty sand that is interbedded with sandy silt and clay. Soil in the area of Site 13 is classified as Sorrento loam. Sorrento loam soils are generally well-drained alluvial fan and floodplain sediments. Runoff is slow, and the erosion hazard is slight for the Sorrento loam. Available water capacity is 11 to 13 inches (Wachtell 1978).

## 3.3 GEOLOGY

The geology of Site 13 consists of Quaternary alluvial and marine deposits. Holocene deposits consist of a matrix of fine-grained overbank deposits and some coarse-grained stream channel deposits. These sediments are derived from the Santa Ana Mountains to the east and conformably overlie Pleistocene interbedded fine-grained lagoonal and near-shore marine deposits. Pleistocene deposits could not be differentiated from Holocene deposits in Phase I RI soil borings. Pleistocene deposits unconformably overlie semiconsolidated marine sandstones, siltstones, and conglomerates of late Miocene to late Pliocene age, which are considered to be bedrock in the area (Jacobs Engineering 1993c).

Lithologic data from the Phase I soil borings indicate that the alluvial sediments at this site consist of silts interbedded with silty and clean sand with traces of gravel. The gravel lenses within the sand units are probably associated with stream channel deposits (Jacobs Engineering 1993a).

### 3.4 HYDROGEOLOGY

MCAS El Toro lies within the Irvine Groundwater Subbasin (~~Irvine Subbasin~~), which is part of the Los Angeles Groundwater Basin. Regional aquifers in the Irvine Groundwater Subbasin tend to be composed of discontinuous lenses of clayey and silty sands and fine-grained gravels contained within a complex assemblage of sandy clays and sandy silts. Two general aquifer systems have been identified near the Station: a principal aquifer zone and a lower hydrogeologic system existing in bedrock. The principal aquifer is the main water-producing zone for the Irvine area.

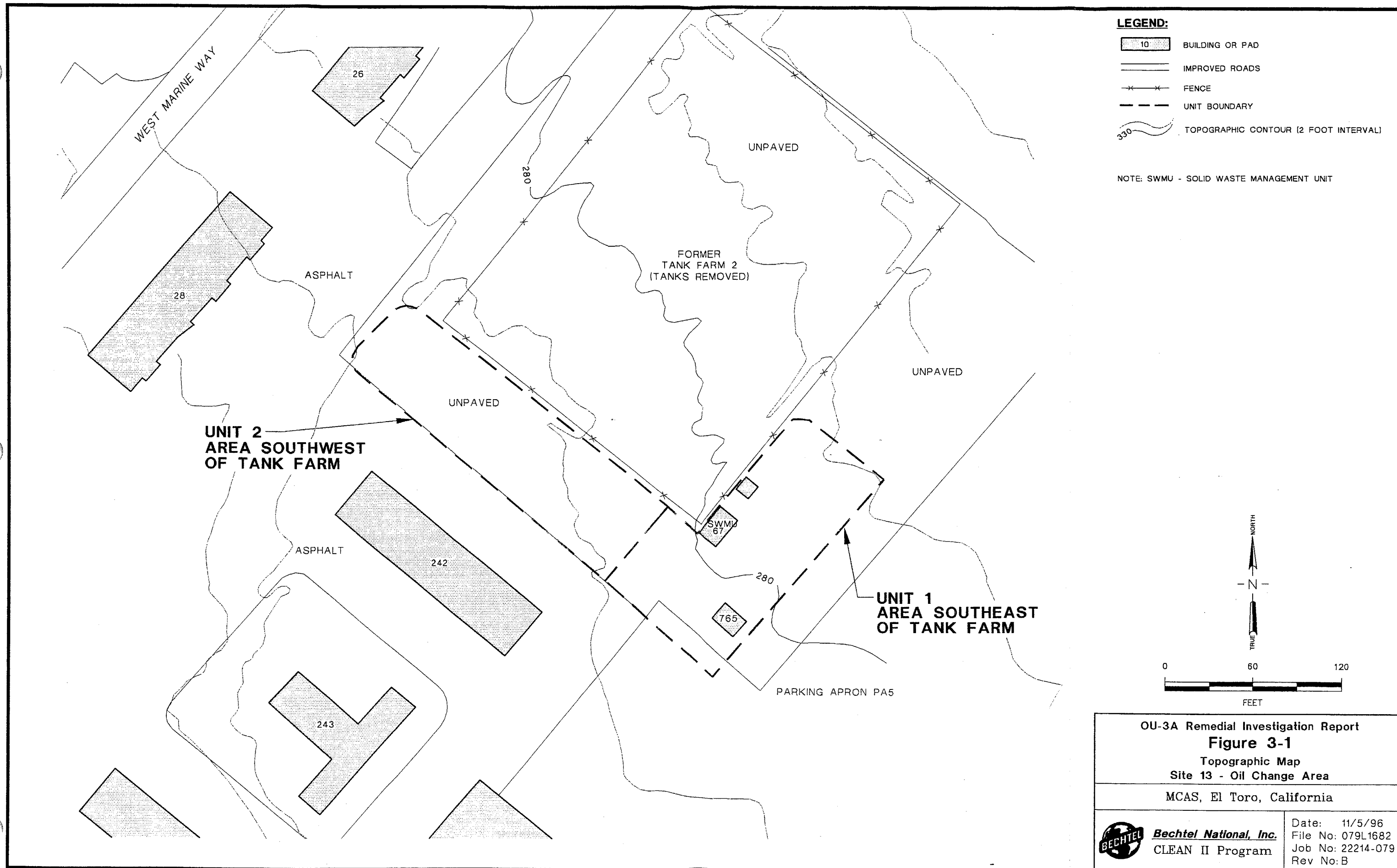
Based on measurements taken in on-site monitoring well 13\_DBMW49 during the Phase I investigation, the principal aquifer is present at a depth of approximately 135 feet bgs. The regional groundwater flow direction in the area of the site is generally to the west-northwest. The hydraulic gradient in the area of the site has been influenced strongly by the pumping of irrigation wells located west of MCAS El Toro (Jacobs Engineering 1993c).

### 3.5 CURRENT LAND USE

Site 13 is currently an unmaintained, slightly vegetated area. The site is not used for any Station operations; however, part of Unit 2 has been used for storage of aircraft parts for the museum housed in Building 242.

### 3.6 ECOLOGY

A habitat assessment was performed for the OU-3A sites in May 1995. The results of this assessment indicated an absence of significant plant and wildlife habitat at Site 13. Therefore, an ecological risk assessment was not performed as part of the Phase II RI/FS for Site 13. The specific results of the habitat assessment for the OU-3A sites are presented in Appendix L.



## Section 4

# NATURE AND EXTENT OF CONTAMINATION

---

This section discusses the reported concentrations and spatial distribution of contaminants at Site 13. Information presented in this section is derived from the Phase I RI (Jacobs Engineering 1993a) sampling and analysis.

## 4.1 SUMMARY OF PHASE I SAMPLING RESULTS

Soil samples were collected at Units 1 and 2 during the Phase I RI. The soil sampling locations are presented in Figure 4-1. The soil sampling methodologies and the sample analytical results are summarized below.

Soil samples were collected at ten on-site locations during the Phase I RI. A summary of the methodology follows.

- Shallow-soil samples (0 to 10 feet bgs) were collected at 0, 2, 4, 5, and/or 10 feet bgs, depending on the boring location. The depths at which samples were collected from each boring location are shown in Table 4-1.
- Deeper subsurface-soil samples (greater than 10 feet bgs) were collected at two on-site locations. Soil samples were collected at 15, 20, 25, 30, 80, 130, and 147 feet bgs during the drilling of monitoring well 13\_DBMW49 and 15, 20, and 25 feet bgs during the drilling of 13\_25B211.
- Soil samples were analyzed for pesticides/PCBs, SVOCs, TAL metals, TPH, TRPH, and VOCs (Table 4-1). One sample from boring 13\_DBMW49 was also analyzed for TOC.
- The TAL metals analyzed during the Phase I RI are aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc.

Results for shallow-soil samples (0 to 10 feet bgs) identified:

- low concentrations (less than 50 micrograms per kilogram [ $\mu\text{g}/\text{kg}$ ]) of VOCs in shallow soil at all sampling locations in Units 1 and 2 (also in field blanks at same magnitude);
- one or more of ten SVOCs (including PAHs) in shallow-soil samples from six of the ten sampling locations in Units 1 and 2;
- diesel and gasoline in shallow-soil samples from nine of the ten sampling locations in Units 1 and 2;
- five pesticides in one sample from Unit 1; and
- twelve of the 23 TAL metals at concentrations above their respective background values in shallow soil.

Results for deeper subsurface-soil samples (greater than 10 feet bgs) showed:

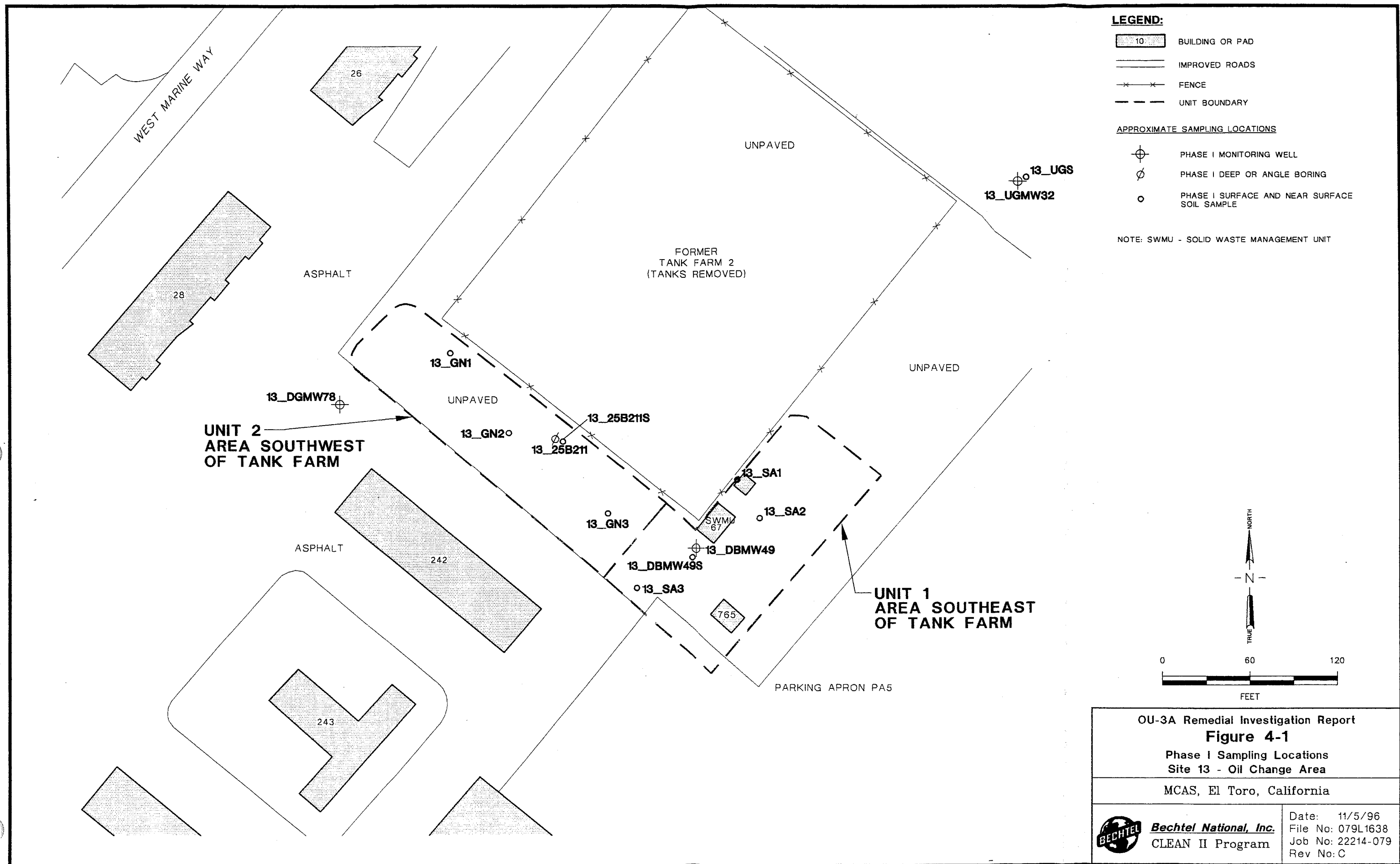
- low concentrations (less than 125 µg/kg) of one or two VOCs (acetone and 2-butanone) in five samples from 13\_25B211 and 13\_DBMW49 (also in field blanks at same magnitude);
- trace concentrations (less than 1 milligram per kilogram [mg/kg]) of gasoline in two samples (20 and 25 feet bgs) from 13\_25B211; and
- nine of the 23 TAL metals above their respective background values in several samples.

A review of the Phase I RI analytical data for deeper subsurface-soil samples suggests that the types and magnitude of analytes reported in deeper subsurface soil do not pose a threat to groundwater at this site. Therefore, in accordance with Work Plan procedures and with concurrence from the BCT, conditions within the deeper subsurface soil interval were not investigated further and are not addressed further in this section or in subsequent sections of this attachment.

Groundwater samples were collected during the Phase I RI from on-site monitoring well 13\_DBMW49, off-site upgradient monitoring well 13\_UGMW32, and off-site downgradient monitoring well 13\_DGMW78. Results of the Phase I Site 13 investigation reported VOCs, SVOCs, and TPH in groundwater beneath Site 13. The highest concentrations were reported in upgradient well 13\_UGMW32. These data, the results of the Phase I Site 13 soil investigation, and the proximity of Site 13 to former Tank Farm No. 2 suggest that the tank farm, rather than Site 13, is the source of local groundwater contamination. Soil and groundwater contamination associated with the USTs formerly located at Tank Farm No. 2 are being addressed under the MCAS El Toro UST program. Therefore, a discussion of the Phase I RI groundwater analytical results is not presented here. The Phase I RI groundwater data can be found in Appendix B13 (Table B13-6) of the Phase I RI Technical Memorandum (Jacobs Engineering 1993b).

## 4.2 NATURE AND EXTENT OF SOIL CONTAMINATION

This section evaluates the Phase I RI data and describes the concentration ranges and the spatial distributions of the analytes identified in soil at Site 13. This information on analyte impacts to soil is needed for fate-and-transport evaluation (Section 5) and human-health risk assessment (Section 6) at Site 13. Five TAL metals (calcium, iron, magnesium, potassium, and sodium) are considered essential nutrients. As such, they are not included in the discussion of nature and extent of contamination presented here or in subsequent sections of this attachment addressing fate and transport and human-health risk. The Phase I fixed-base laboratory data include a variety of tentatively identified compounds (TICs) most commonly associated with the VOC, SVOC, and TPH analytical results. Because the identification of these compounds is uncertain, they are not addressed in this section. TIC data are included in Appendix J of this report and their presence will be noted as part of the overall discussion of risk (Section 6) for this site. The BCT agreed that Phase II RI soil sampling was unnecessary at Site 13; therefore, information for the analysis of nature and extent of contamination (Section 4), fate and



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**Figure 4-1**  
 Phase I Sampling Locations  
 Site 13 - Oil Change Area  
 MCAS, El Toro, California



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 Rev No: C

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**Table 4-1  
Summary of Phase I Soil Sample Analyses**

Unit	Sampling Location	Phase I Sample Depths (feet bgs <sup>a</sup> )	SVOCs <sup>b</sup> U.S. EPA <sup>c</sup> CLP <sup>d</sup> OLM <sup>e</sup> 01.5	VOCs <sup>f</sup> U.S. EPA CLP OLM 01.5	TPH <sup>g</sup> CA LUFT/SW <sup>h</sup>	TRPH <sup>i</sup> U.S. EPA 418.1	Pesticides/PCBs <sup>j</sup> U.S. EPA CLP OLM 01.5	Total Metals U.S. EPA 200 Series	Total Organic Carbon U.S. EPA CLP
1	13_SA1	0, 2	X	X	X	X		X	
	13_SA2	0, 2, 4	X	X	X	X		X	
	13_SA3	0, 2, 4	X	X	X	X		X	
	13_DBMW49S	0	X	X	X	X		X	
	13_DBMW49	5, 10, 15, 20, 25, 30, 80, 130, 147	X (8) <sup>k</sup>	X (8)	X (8)	X (8)	X (8)	X (8)	X (1)
2	13_GN1	0, 2	X	X	X	X		X	
	13_GN2	0, 2, 4	X	X	X	X		X	
	13_GN3	0, 2	X	X	X	X		X	
	13_25B211S	0	X	X	X	X		X	
	13_25B211	5, 10, 15, 20, 25	X	X	X	X		X	

**Notes:**

- <sup>a</sup> bgs – below ground surface
- <sup>b</sup> SVOC – semivolatile organic compound
- <sup>c</sup> U.S. EPA – United States Environmental Protection Agency
- <sup>d</sup> CLP – (U.S. EPA) Contract Laboratory Program
- <sup>e</sup> OLM – organic laboratory method
- <sup>f</sup> VOC – volatile organic compound
- <sup>g</sup> TPH – total petroleum hydrocarbons
- <sup>h</sup> CA LUFT/SW – California Leaking Underground Fuel Tank Program/Solid Waste
- <sup>i</sup> TRPH – total recoverable petroleum hydrocarbons
- <sup>j</sup> PCB – polychlorinated biphenyl
- <sup>k</sup> value in parentheses indicates the number of fixed-based laboratory confirmation analyses performed at this location (if different from the total number of samples collected)



transport (Section 5), and human-health risk assessment (Section 6) has been derived solely from Phase I RI data.

Site 13 consists of two contiguous units. Units 1 and 2 will be addressed together here and in subsequent sections of this attachment for the following reasons:

- Site conditions. The two units are relatively flat, unpaved, generally unvegetated areas.
- Historical activities. Historical aerial photographs suggest that the same activity (changing crankcase oil) was conducted in both units at this site.
- Analytical data suggest that the distribution of contaminants in shallow soil is continuous across the boundaries between the units.

### **4.3 ~~UNITS 1 AND 2, AREAS SOUTHEAST AND SOUTHWEST OF TANK FARM~~**

The distribution of the classes of analytes reported in shallow soil at Units 1 and 2 is illustrated on Figures 4-2 and 4-3. Analytical data from the Phase I investigation are presented in Tables 4-2 and 4-3 and in Appendix B13 (Tables B13-2 and B13-3) of the Phase I RI Technical Memorandum.

#### **4.23.1 Units 1 and 2: Fixed-Base Laboratory Results**

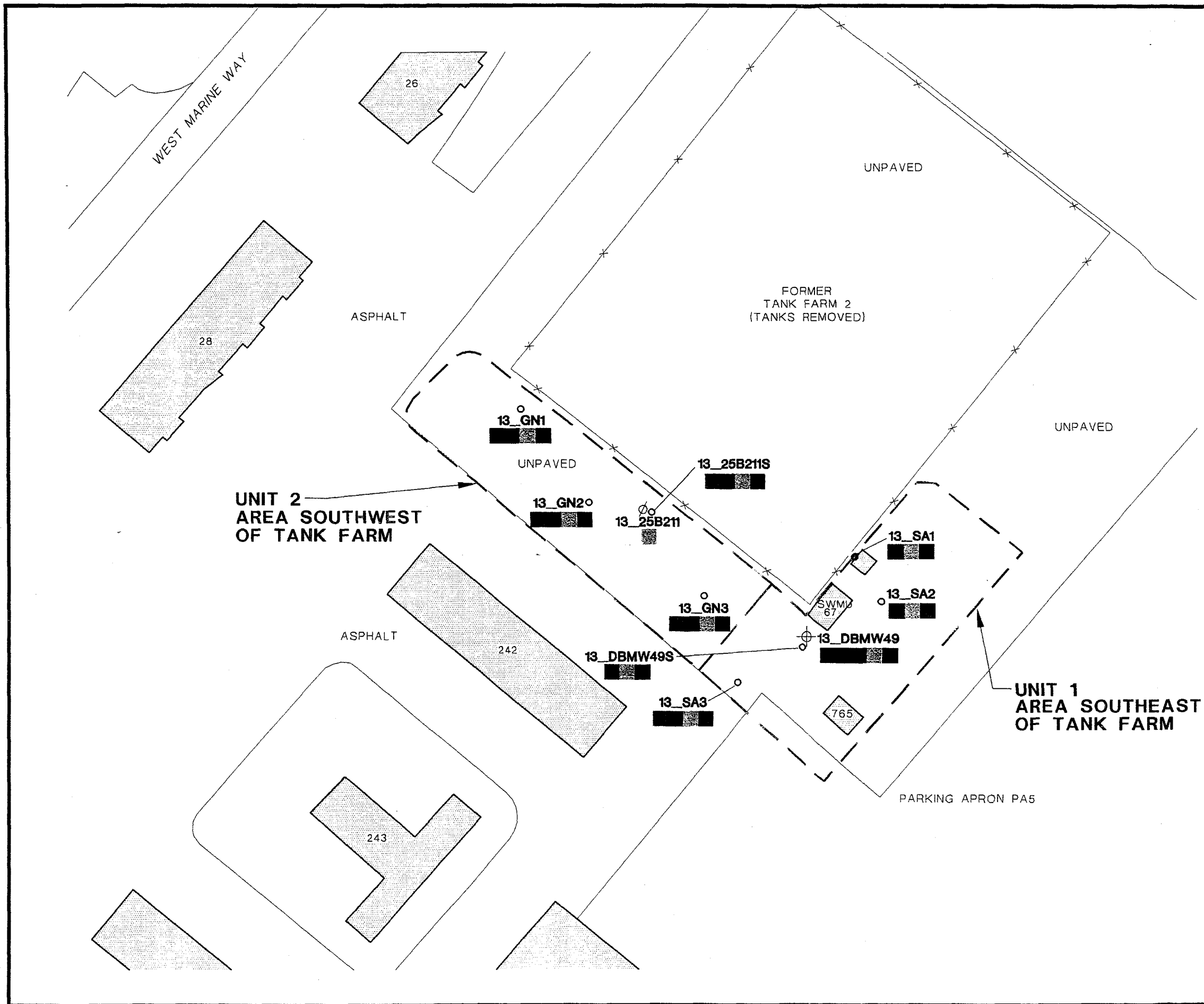
Fixed-base laboratory results for shallow-soil samples from the Phase I RI of Units 1 and 2 reported VOCs, SVOCs (including polynuclear aromatic hydrocarbons [PAHs]), TPH, pesticides/PCBs, and TAL metals. This section discusses the concentrations and distribution of these reported analytes in the 0 to 10 feet bgs shallow soil interval.

##### **4.23.1.1 VOLATILE ORGANIC COMPOUNDS**

~~The VOCs~~ 2-butanone, acetone, and toluene were the only VOCs reported in shallow-soil samples from Site 13. VOCs were reported in samples from all locations. The highest reported concentration was 43 µg/kg for acetone in the 2-foot-bgs sample from 13\_GN3. The highest reported toluene concentration was 9 µg/kg in the surface sample from 13\_GN2, and the highest reported 2-butanone concentration was 4 µg/kg in the 10-foot-bgs sample from 13\_DBMW49. Acetone and 2-butanone were also reported in field blanks at the same order of magnitude.

##### **4.23.1.2 SEMIVOLATILE ORGANIC COMPOUNDS AND POLYNUCLEAR AROMATIC HYDROCARBONS**

SVOCs and PAHs were reported in six (13\_GN1, 13\_GN2, 13\_GN3, 13\_SA3, 13\_DBMW49, and 13\_25B211S) of the ten sampling locations. All SVOCs and PAHs were reported in surface samples except for benzyl butyl phthalate, reported in the 2-foot-bgs sample from 13\_GN1 and bis(2-ethylhexyl)phthalate reported in the 5-foot-bgs sample from 13\_DBMW49. The highest concentration was 330 µg/kg reported for



# **LEGEND:**

- 10 BUILDING OR PAD
- IMPROVED ROADS
- FENCE
- UNIT BOUNDARY

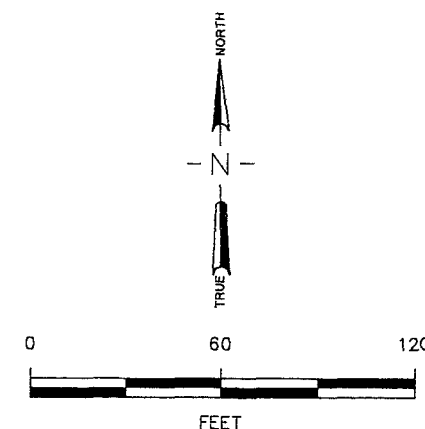
## **APPROXIMATE SAMPLING LOCATIONS**

- PHASE I MONITORING WELL
- PHASE I DEEP OR ANGLE BORING
- PHASE I SURFACE AND NEAR SURFACE SOIL SAMPLE

## **ANALYTES IDENTIFIED AT SAMPLING LOCATION**

- SVOCs/PAHs
- PESTICIDES
- PETROLEUM HYDROCARBONS (TPH AND TRPH)
- TAL METALS (ABOVE BACKGROUND)
- VOCs

NOTE: SWMU - SOLID WASTE MANAGEMENT UNIT



OU-3A Remedial Investigation Report

## **Figure 4-2**

Analytes Identified in Phase I Soil Samples  
Site 13 - Oil Change Area

MCAS, El Toro, California

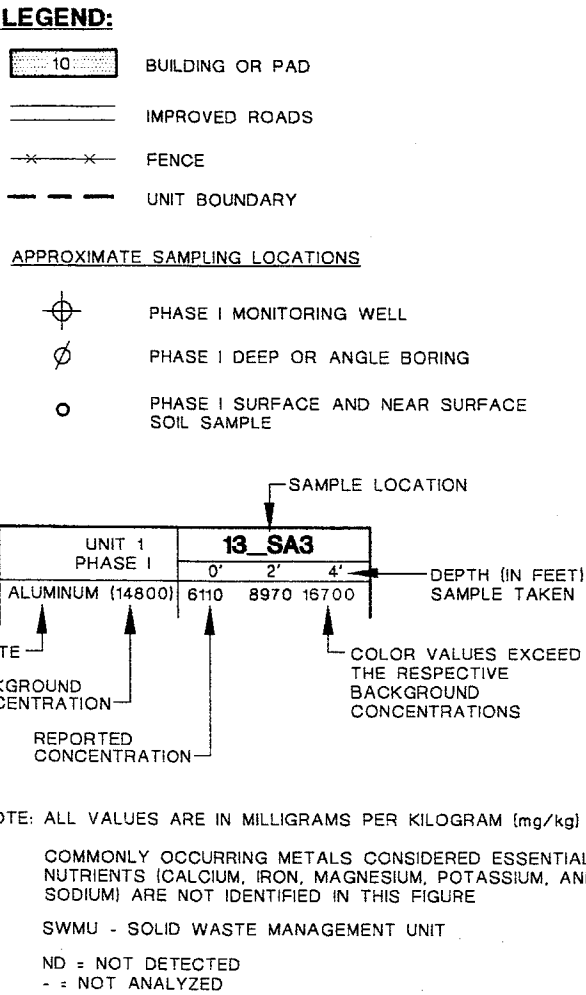
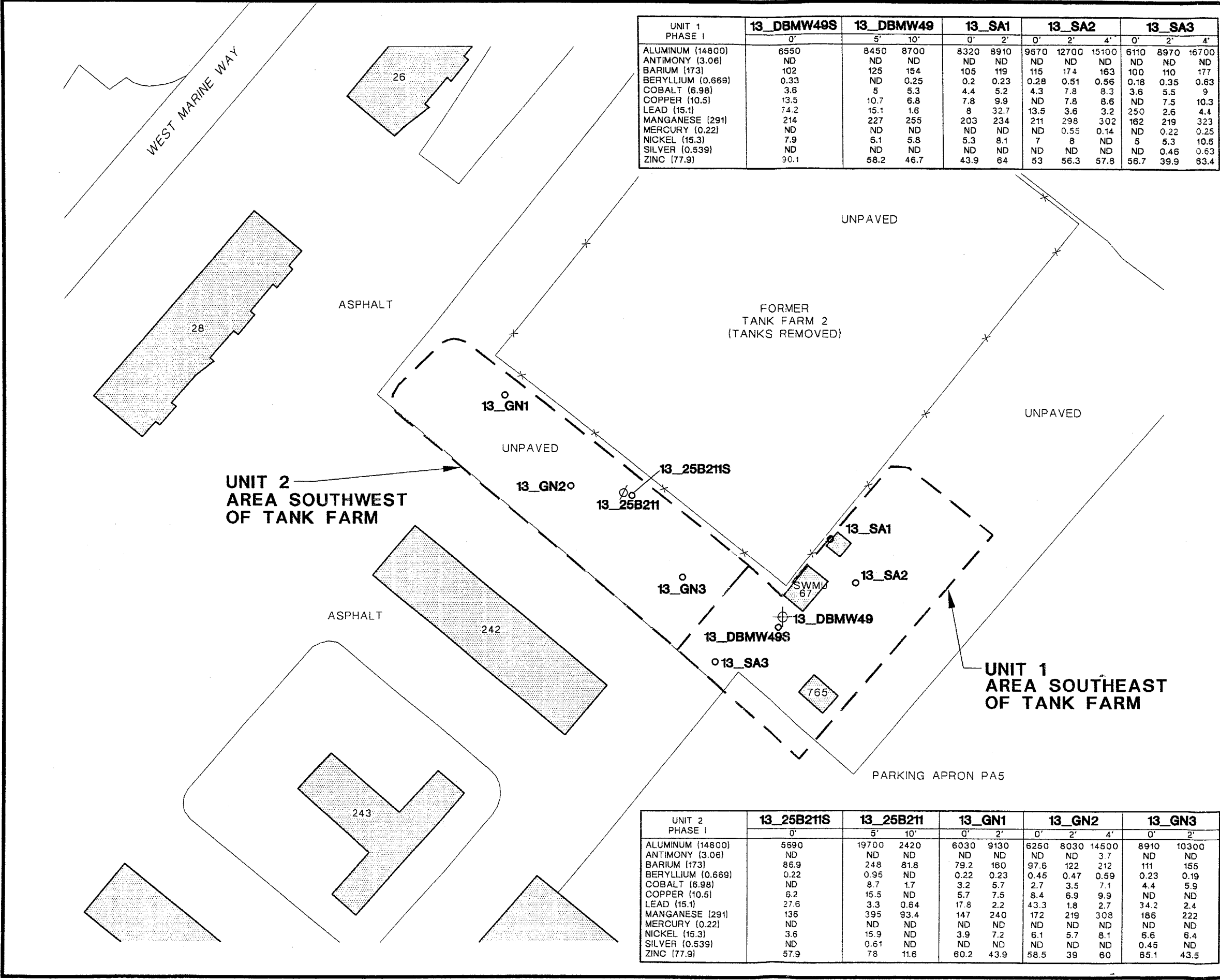


**Bechtel National, Inc.**  
CLEAN II Program

Date: 11/5/96  
File No: 079L1636  
Job No: 22214-079  
Rev No: D

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**Table 4-2**  
**Unit 1 Phase I Soil Data Summary**

Analyte Name/ Method Code	Result Units	STATION LOCATIONS/SAMPLE DEPTH (feet bgs <sup>1</sup> )									
		13_DBMW49 5	13_DBMW49 10	13_DBMW49 15	13_DBMW49 20	13_DBMW49 25	13_DBMW49 30	13_DBMW49 80	13_DBMW49 130	13_DBMW49 147	13_DBMW49S 0
VOCs <sup>b</sup> /U.S. EPA <sup>c</sup> CLP <sup>d</sup> OLM <sup>e</sup> 01.5											
2-butanone	µg/kg <sup>f</sup>	3 J**g	4 J**	11 U <sup>h</sup>	5 J**	12 U	3 J**	12 U	5 J**	— <sup>i</sup>	12 U
Acetone	µg/kg	15 U	90 U	38 U	79**j	98 U	29 U	40 U	120 d***k	—	14**
Toluene	µg/kg	11 U	12 U	11 U	13 U	12 U	11 U	12 U	11 U	—	6 J <sup>l</sup>
TPH <sup>m</sup> /U.S. EPA 418.1											
TRPH <sup>n</sup>	mg/kg <sup>o</sup>	1,605	20 U	20 U	20 U	20 U	20 U	20 U	20 U	—	3,340
TPH/CA LUFT/SW <sup>p</sup>											
Diesel	µg/kg	109,000 J	18,100 UJ <sup>q</sup>	14,200 UJ	16,500 UJ	14,800 UJ	14,000 UJ	14,800 UJ	13,800 UJ	—	490,000
Gasoline	µg/kg	56.5 U	58 U	56.6 U	65.9 U	59.2 U	55.9 U	59 U	55.1 U	—	264
SVOC <sup>r</sup> /U.S. EPA CLP OLM 01.5											
bis(2-ethylhexyl)phthalate	µg/kg	260 J**s	770 U	750 U	870 U	780 U	200 J*	780 U	730 U	—	780 UJ
PAHs <sup>t</sup> /U.S. EPA CLP OLM 01.5											
Benzo(b)fluoranthene	µg/kg	750 U	770 U	750 U	870 U	780 U	740 U	780 U	730 U	—	780 UJ
Benzo(k)fluoranthene	µg/kg	750 U	770 U	750 U	870 U	780 U	740 U	780 U	730 U	—	780 UJ
Chrysene	µg/kg	750 U	770 U	750 U	870 U	780 U	740 U	780 U	730 U	—	780 UJ
Fluoranthene	µg/kg	750 U	770 U	750 U	870 U	780 U	740 U	780 U	730 U	—	780 U
Phenanthrene	µg/kg	750 U	770 U	750 U	870 U	780 U	740 U	780 U	730 U	—	780 U
Pyrene	µg/kg	750 U	770 U	750 U	870 U	780 U	740 U	780 U	730 U	—	780 UJ
Pesticides/U.S. EPA CLP OLM 01.5											
4,4'-DDD <sup>u</sup>	µg/kg	6.69	3.83 U	3.74 U	4.35 U	3.91 U	3.69 U	3.9 U	3.64 U	—	—
4,4'-DDT <sup>v</sup>	µg/kg	12.5	3.83 U	3.74 U	4.35 U	3.91 U	3.69 U	3.9 U	3.64 U	—	—
delta-BHC <sup>w</sup>	µg/kg	5.03	1.97 U	1.93 U	2.24 U	2.01 U	1.9 U	2.01 U	1.87 U	—	—
Endosulfan sulfate	µg/kg	5.77	3.83 U	3.74 U	4.35 U	3.91 U	3.69 U	3.9 U	3.64 U	—	—
Endrin ketone	µg/kg	5.2	3.83 U	3.74 U	4.35 U	3.91 U	3.69 U	3.9 U	3.64 U	—	—

(table continues)

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Table 4-2 (continued)

Analyte Name/ Method Code	Result Units	STATION LOCATIONS/SAMPLE DEPTH (feet bgs <sup>1</sup> )									
		13_DBMW49 5	13_DBMW49 10	13_DBMW49 15	13_DBMW49 20	13_DBMW49 25	13_DBMW49 30	13_DBMW49 80	13_DBMW49 130	13_DBMW49 147	13_DBMW49S 0
Metals/U.S. EPA 200.7/S, 239.2/S, 279.2/S, SW7471											
Aluminum (14,800) <sup>x</sup>	mg/kg	8,450	8,700	5,400	20,300	11,500	6,710	6,880	2,270	—	6,550
Antimony (3.06)	mg/kg	2.6 U	2.5 U	2.5 U	3 b <sup>y</sup>	2.6 U	2.7 b	2.6 U	2.4 U	—	2.5 U
Arsenic (6.86)	mg/kg	2.4	2.2 b	2.1 b	6	3.6	1.8 b	2.9	0.93 b	—	2.9
Barium (173)	mg/kg	125	154	126	176	182	96.9	168	26.4 b	—	102
Beryllium (0.669)	mg/kg	0.19 U	0.25 b	0.18 U	0.5 b	0.38 b	0.19 U	0.19 U	0.17 U	—	0.33 b
Cadmium (2.35)	mg/kg	1 b	1 b	0.64 b	1.7	1.4	1.3	1.1 b	0.52 b	—	2
Chromium (26.9)	mg/kg	10.4	9.1	5.7	18.6	12.2	7.5	7.4	3.2	—	14.3
Cobalt (6.98)	mg/kg	5 b	5.3 b	3.2 b	9.2 b	7.5 b	4.2 b	4.3 b	1.7 U	—	3.6 b
Copper (10.5)	mg/kg	10.7	6.8	6.3	12.7	9.8	5.6 b	4.7 b	1.7 b	—	13.5
Lead (15.1)	mg/kg	15.1 b	1.6	1.6	4.2	3	1	1.8	0.72	—	74.2
Manganese (291)	mg/kg	227	255	183	376	298	195	201	56.9	—	214
Mercury (0.22)	mg/kg	0.03 Ub <sup>z</sup>	0.03 Ub	0.03 Ub	0.03 Ub	0.03 Ub	0.03 Ub	0.03 Ub	0.03 Ub	—	0.03 U
Nickel (15.3)	mg/kg	6.1 b	5.8 b	4.2 b	13.3	10.8	7.4 b	5.6 b	1.7 U	—	7.9 b
Selenium (0.32)	mg/kg	0.1 U	0.09 U	0.09 U	0.1 U	0.09 U	0.09 U	0.09 U	0.09 U	—	0.14 b
Silver (0.539)	mg/kg	0.33 U	0.32 U	0.31 U	0.5 b	0.33 U	0.33 U	0.33 U	0.3 U	—	0.43 U
Thallium (0.42)	mg/kg	0.19 U	0.21 b	0.18 U	0.42 b	0.42 b	0.19 U	0.24 b	0.17 U	—	0.14 U
Vanadium (71.8)	mg/kg	28.9	31.3	20.4	63.8	43.4	29.3	29.2	9 b	—	23.3
Zinc (77.9)	mg/kg	58.2	46.7	30	81	60.4	35	30.5	9.1	—	90.1
General chemistry/CE81-1(S1D)											
Total organic carbon	mg/kg <sub>w</sub> <sup>aa</sup>	—	—	—	—	—	—	—	—	183	—

(table continues)



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Table 4-2 (continued)

Analyte Name/ Method Code	Result Units	SAMPLE LOCATIONS/SAMPLE DEPTH (feet bgs <sup>b</sup> )							
		13_SA1 0	13_SA1 2	13_SA2 0	13_SA2 2	13_SA2 4	13_SA3 0	13_SA3 2	13_SA3 4
VOCs/U.S. EPA CLP OLM 01.5									
2-butanone	µg/kg	10 U	11 U	10 U	11 U	11 U	10 U	11 U	12 U
Acetone	µg/kg	16**	11 U	34**	5 J**	8 J**	12**	5 J**	6 J**
Toluene	µg/kg	6 J	3 J	8 J	6 J	11 U	6 J	3 J	5 J
TPH/U.S. EPA 418.1									
TRPH	mg/kg	22	197	147	20 U	20 U	457	20 U	20 U
TPH/CA LUFT/SW									
Diesel	µg/kg	12,600 UJ	52,100 J	12,800 U	14,200 U	14,000 U	35,400	13,800 U	14,600 U
Gasoline	µg/kg	130	319	90.3	57.3 U	56.3 U	67.7	55.5 U	59 U
SVOC/U.S. EPA CLP OLM 01.5									
bis(2-ethylhexyl)phthalate	µg/kg	670 U	750 U	20,000 U	760 U	740 U	150 J*	730 U	780 U
PAHs/U.S. EPA CLP OLM 01.5									
Benzo(b)fluoranthene	µg/kg	670 U	750 U	20,000 U	760 U	740 U	210 J	730 U	780 U
Benzo(k)fluoranthene	µg/kg	670 U	750 U	20,000 U	760 U	740 U	180 J	730 U	780 U
Chrysene	µg/kg	670 U	750 U	20,000 U	760 U	740 U	170 J	730 U	780 U
Fluoranthene	µg/kg	670 U	750 U	20,000 U	760 U	740 U	300 J	730 U	780 U
Phenanthrene	µg/kg	670 U	750 U	20,000 U	760 U	740 U	200 J	730 U	780 U
Pyrene	µg/kg	670 U	750 U	20,000 U	760 U	740 U	170 J	730 U	780 U
Pesticides/U.S. EPA CLP OLM 01.5									
4,4'-DDD	µg/kg	—	—	—	—	—	—	—	—
4,4'-DDT	µg/kg	—	—	—	—	—	—	—	—
delta-BHC	µg/kg	—	—	—	—	—	—	—	—
Endosulfan sulfate	µg/kg	—	—	—	—	—	—	—	—
Endrin ketone	µg/kg	—	—	—	—	—	—	—	—

(table continues)

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Table 4-2 (continued)

Analyte Name/ Method Code	Result Units	SAMPLE LOCATIONS/SAMPLE DEPTH (feet bgs <sup>a</sup> )							
		13_SA1	13_SA1	13_SA2	13_SA2	13_SA2	13_SA3	13_SA3	13_SA3
		0	2	0	2	4	0	2	4
Metals/U.S. EPA 200.7/S, 239.2/S, 279.2/S, SW7471									
Aluminum (14,800)	mg/kg	8,320	8,910	9,570	12,700	15,100	6,110	8,970	16,700
Antimony (3.06)	mg/kg	2.5 U	2.8 U	2.5 U	2.8 U	2.7 U	2.5 U	2.7 U	2.9 U
Arsenic (6.86)	mg/kg	2.8	3.6	2 b	2.4 U	2.8 U	3.5	276 U	3.4
Barium (173)	mg/kg	105	119	115	174	163	100	110	177
Beryllium (0.669)	mg/kg	0.2 b	0.23 b	0.28 b	0.51 b	0.56 b	0.18 b	0.35 b	0.63 b
Cadmium (2.35)	mg/kg	0.78 b	1.4	1	0.62 U	0.61 U	1.3	0.61 U	0.65 U
Chromium (26.9)	mg/kg	9.4	12.1	10.3	12.8	13.7	9	9	15.8
Cobalt (6.98)	mg/kg	4.4 b	5.2 b	4.3 b	7.8 b	8.3 b	3.6 b	5.5 b	9 b
Copper (10.5)	mg/kg	7.8	9.9	8.6 U	7.8	8.6	10.2 U	7.5	10.3
Lead (15.1)	mg/kg	8	32.7	13.5	3.6	3.2	250	2.6	4.4
Manganese (291)	mg/kg	203	234	211	298	302	162	219	323
Mercury (0.22)	mg/kg	0.03 U	0.03 U	0.03 U	0.55	0.14	0.03 U	0.22	0.25 b
Nickel (15.3)	mg/kg	5.3 b	8.1 b	7 b	8 b	6.7 U	5 b	5.3 b	10.5
Selenium (0.32)	mg/kg	0.1 U	0.11 U	0.1 U	4.7 U	4.6 U	0.15 b	4.6 U	4.9 U
Silver (0.539)	mg/kg	0.43 U	0.48 U	0.43 U	0.33 U	0.33 U	0.43 U	0.46 b	0.63 b
Thallium (0.42)	mg/kg	0.14 U	0.23 b	0.14 b	0.36 U	0.35 U	0.14 U	0.35 U	0.37 U
Vanadium (71.8)	mg/kg	27.3	30.8	31.4	41.1	45.5	22.7	30.2	50.7
Zinc (77.9)	mg/kg	43.9	64	53	56.3	57.8	56.7	39.9	63.4
General chemistry/CE81-1(S1D									
Total organic carbon	mg/kg <sub>w</sub>	—	—	—	—	—	—	—	—

- Notes:
- <sup>a</sup> bgs – below ground surface
  - <sup>b</sup> VOC – volatile organic compound
  - <sup>c</sup> U.S. EPA – United States Environmental Protection Agency
  - <sup>d</sup> CLP – (U.S. EPA) Contract Laboratory Program
  - <sup>e</sup> OLM – organic laboratory method
  - <sup>f</sup> µg/kg – micrograms per kilogram
  - <sup>g</sup> J\*\* – estimated value, compound is observed in field blanks at the same order of magnitude
  - <sup>h</sup> U – compound not detected
  - <sup>i</sup> — – not analyzed
  - <sup>j</sup> \*\* – compound is observed in field blanks at the same order of magnitude
  - <sup>k</sup> d\*\* – reported value is from a dilute analysis and compound is observed in field blanks at the same order of magnitude
  - <sup>l</sup> J – estimated value
  - <sup>m</sup> TPH – total petroleum hydrocarbons
  - <sup>n</sup> TRPH – total recoverable petroleum hydrocarbons
  - <sup>o</sup> mg/kg – milligrams per kilogram
  - <sup>p</sup> CA LUFT/SW – California Leaking Underground Fuel Tank/Solid Waste
  - <sup>q</sup> UJ – compound not detected, estimated detection limit
  - <sup>r</sup> SVOC – semivolatile organic compound
  - <sup>s</sup> J\* – estimated value, compound is observed in sample at concentration 5 to 10 times greater than that observed in the field blanks
  - <sup>t</sup> PAH – polynuclear aromatic hydrocarbon
  - <sup>u</sup> DDD – dichlorodiphenyldichloroethane
  - <sup>v</sup> DDT – dichlorodiphenyltrichloroethane
  - <sup>w</sup> BHC – hexachlorocyclohexane
  - <sup>x</sup> values in parentheses are background concentrations for metals at Marine Corps Air Station El Toro (see Appendix D)
  - <sup>y</sup> b – reported value is less than the contract-required detection limit but greater than or equal to the instrument detection limit
  - <sup>z</sup> Ub – compound not detected, detection limit less than the contract-required detection limit
  - <sup>aa</sup> mg/kg<sub>w</sub> – milligrams per kilogram by wet weight

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**Table 4-3**  
**Unit 2 Phase I Soil Data Summary**

Analyte Name/ Method Code	Result Units	SAMPLE LOCATIONS/SAMPLE DEPTH (feet bgs <sup>a</sup> )												
		13_25B211 5	13_25B211 10	13_25B211 15	13_25B211 20	13_25B211 25	13_25B211S 0	13_GN1 0	13_GN1 2	13_GN2 0	13_GN2 2	13_GN2 4	13_GN3 0	13_GN3 2
VOCs <sup>b</sup> /U.S. EPA <sup>c</sup> CLP <sup>d</sup> OLM <sup>e</sup> 01.5														
Acetone	µg/kg <sup>f</sup>	12 U <sup>g</sup>	10 U	4 J <sup>***h</sup>	12 U	4 J <sup>**</sup>	3 J <sup>**</sup>	10 <sup>**i</sup>	11 U	10 U	11 U	12 U	23 <sup>**</sup>	43 <sup>**</sup>
Toluene	µg/kg	12 U	10 U	11 U	12 U	12 U	3 J <sup>j</sup>	4 J	11 U	9 J	11 U	12 U	5 J	11 U
TPH <sup>k</sup> /U.S. EPA 418.1														
TRPH <sup>l</sup>	mg/kg <sup>m</sup>	20 U	20 U	20 U	20 U	20 U	54	16 U	20 U	328	20 U	20 U	160	20 U
TPH/CA LUFT/SW <sup>n</sup>														
Gasoline	µg/kg	61.3 U	51.3 U	57.1 U	241	79.8	149	137	56.4 U	196	57.1 U	58.1 U	55.9	54.3 U
SVOCs <sup>o</sup> /U.S. EPA CLP OLM 01.5														
Benzyl butyl phthalate	µg/kg	810 U	680 U	750 U	800 U	770 U	670 U	670 U	160 J	670 U	750 U	770 U	670 U	720 UJ <sup>p</sup>
bis(2-ethylhexyl)phthalate	µg/kg	810 U	680 U	750 U	800 U	770 U	670 U	270 J <sup>*q</sup>	740 U	670 U	750 U	770 U	670 U	720 UJ
PAHs <sup>r</sup> /U.S. EPA CLP OLM 01.5														
Benzo(a)pyrene	µg/kg	810 U	680 U	750 U	800 U	770 U	210 J	670 U	740 U	670 U	750 U	770 U	670 U	720 UJ
Benzo(b)fluoranthene	µg/kg	810 U	680 U	750 U	800 U	770 U	260 J	670 U	740 U	670 U	750 U	770 U	140 J	720 UJ
Benzo(g,h,i)perylene	µg/kg	810 U	680 U	750 U	800 U	770 U	200 J	670 U	740 U	160 J	750 U	770 U	670 U	720 UJ
Benzo(k)fluoranthene	µg/kg	810 U	680 U	750 U	800 U	770 U	190 J	670 U	740 U	670 U	750 U	770 U	670 U	720 UJ
Chrysene	µg/kg	810 U	680 U	750 U	800 U	770 U	210 J	670 U	740 U	670 U	750 U	770 U	670 U	720 UJ
Fluoranthene	µg/kg	810 U	680 U	750 U	800 U	770 U	330 J	670 U	740 U	670 U	750 U	770 U	670 U	720 UJ
Indeno(1,2,3-c,d)pyrene	µg/kg	810 U	680 U	750 U	800 U	770 U	230 J	670 U	740 U	670 U	750 U	770 U	670 U	720 UJ
Pyrene	µg/kg	810 U	680 U	750 U	800 U	770 U	270 J	670 U	740 U	670 U	750 U	770 U	670 U	720 UJ
Metals/U.S. EPA 200.7/S, 239.2/S														
Aluminum (14,800) <sup>s</sup>	mg/kg	19,700 b <sup>t</sup>	2,420 b	11,900 b	19,600 b	13,600 b	5,690	6,030	9,130	6,250	8,030	14,500	8,910	10,300
Antimony (3.06)	mg/kg	2.9 Ub <sup>u</sup>	2.5 Ub	2.8 Ub	2.9 Ub	2.8 Ub	2.5 U	2.5 U	2.8 U	2.5 U	2.7 U	3.7 b	2.5 U	2.7 U
Arsenic (6.86)	mg/kg	3.3 b	0.92 b	3.1 b	3.8 b	3 b	2.5	2.7	2.2 U	2.9	1.7 b	3.9	2.5	1.7 b
Barium (173)	mg/kg	248 b	81.8 b	194 b	271 b	173 b	86.9	79.2	160	97.6	122	212	111	155
Beryllium (0.669)	mg/kg	0.95 b	0.21 Ub	0.69 b	0.81 b	0.69 b	0.22 b	0.22 b	0.23 b	0.45 b	0.47 b	0.59 b	0.23 b	0.19 b
Cadmium (2.35)	mg/kg	1.8 b	0.29 b	1.2 b	1.9 b	1.4 b	1 b	0.93 b	1 b	1.3	0.76 b	1.2	1.5	0.9 b
Chromium (26.9)	mg/kg	19 b	3.3 b	12.5 b	19.9 b	14.6 b	8.8	7.3	9.5	9.4	8.7	13.7	10.6	9.9
Cobalt (6.98)	mg/kg	8.7 b	1.7 b	5.4 b	9.3 b	7 b	1.2 U	3.2 b	5.7 b	2.7 b	3.5 b	7.1 b	4.4 b	5.9 b
Copper (10.5)	mg/kg	15.5 b	2.7 Ub	9.4 b	13.5 b	10.8 b	6.2	5.7	7.5	8.4	6.9	9.9	9.3 U	7.6 U
Lead (15.1)	mg/kg	3.3 b	0.64 b	2.2 b	3.1 b	2.4 b	27.6	17.8	2.2	43.3	1.8	2.7	34.2	2.4
Manganese (291)	mg/kg	395 b	93.4 b	291 b	355 b	302 b	136	147	240	172	219	308	186	222
Nickel (15.3)	mg/kg	15.9 b	1.6 Ub	9 b	12.7 b	10.9 b	3.6 b	3.9 b	7.2 b	6.1 b	5.7 b	8.1 b	6.6 b	6.4 b
Selenium (0.32)	mg/kg	0.12 Ub	0.1 Ub	0.14 b	0.12 Ub	0.12 Ub	0.1 U	0.1 U	0.11 U	0.11 b	0.11 U	0.12 U	0.1 U	0.11 U
Silver (0.539)	mg/kg	0.61 b	0.43 Ub	0.53 b	0.89 b	0.91 b	0.43 U	0.43 U	0.48 U	0.43 U	0.46 U	0.49 U	0.45 b	0.47 U
Thallium (0.42)	mg/kg	0.36 b	0.14 Ub	0.27 b	0.38 b	0.21 b	0.14 U	0.16 b	0.25 b	0.14 U	0.15 b	0.21 b	0.14 U	0.29 b
Vanadium (71.8)	mg/kg	61.6 b	9.7 b	41.2 b	64.4 b	50.1 b	18.3	20.9	29.4	21.5	28.5	47.2	28.2	32.1
Zinc (77.9)	mg/kg	78 b	11.6 b	53.5 b	72.3 b	57 b	57.9	60.2	43.9	58.5	39	60	65.1	43.5

(table continues)

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Table 4-3 (continued)

- Notes:
- <sup>a</sup> bgs – below ground surface
  - <sup>b</sup> VOC – volatile organic compound
  - <sup>c</sup> U.S. EPA – United States Environmental Protection Agency
  - <sup>d</sup> CLP – (U.S. EPA) Contract Laboratory Program
  - <sup>e</sup> OLM – organic laboratory method
  - <sup>f</sup> µg/kg – micrograms per kilogram
  - <sup>g</sup> U – compound not detected
  - <sup>h</sup> J\*\* – estimated value, compound is observed in field blanks at the same order of magnitude
  - <sup>i</sup> \*\* – compound is observed in field blanks at the same order of magnitude
  - <sup>j</sup> J – estimated value
  - <sup>k</sup> TPH – total petroleum hydrocarbons
  - <sup>l</sup> TRPH – total recoverable petroleum hydrocarbons
  - <sup>m</sup> mg/kg – milligrams per kilogram
  - <sup>n</sup> CA LUFT/SW – California Leaking Underground Fuel Tank/Solid Waste
  - <sup>o</sup> SVOC – semivolatile organic compound
  - <sup>p</sup> UJ – compound not detected, estimated detection limit
  - <sup>q</sup> J\* – estimated value, compound is observed in sample at concentration 5 to 10 times greater than that observed in the field blanks
  - <sup>r</sup> PAH – polynuclear aromatic hydrocarbon
  - <sup>s</sup> values in parentheses are background concentrations for metals at Marine Corps Air Station El Toro (see Appendix D)
  - <sup>t</sup> b – reported value is less than the contract-required detection limit but greater than or equal to the instrument detection limit (see Table 4-2)
  - <sup>u</sup> Ub – compound not detected, detection limit less than the contract-required detection limit



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## Section 4 Nature and Extent of Contamination

fluoranthene in the surface sample from 13\_25B211S. All other SVOC and PAH concentrations were between 140 and 300 µg/kg.

### 4.23.1.3 TOTAL PETROLEUM HYDROCARBONS

Diesel was reported in the surface samples from 13\_DBMW49S and 13\_SA3, the 2-foot-bgs sample from 13\_SA1, and the 5-foot-bgs sample from 13\_DBMW49. The highest diesel concentration was 490,000 µg/kg~~490 mg/kg~~ in the surface sample from 13\_DBMW49S.

Gasoline was reported in surface samples from eight of the ten sampling locations and one 2-foot-bgs sample. The highest concentration of gasoline (319 µg/kg~~0.319 mg/kg~~) was reported in the 2-foot-bgs sample from 13\_SA1.

TRPH was reported in shallow soil from all sampling locations except 13\_GN1 and 13\_25B211. The surface sample from 13\_DBMW49S and the 5-foot-bgs sample from 13\_DBMW49 had the highest TRPH concentrations, 3,340 and 1,605 mg/kg, respectively. All other reported TRPH concentrations were less than 500 mg/kg. Except for the 5-foot-bgs sample from boring 13\_DBMW49, diesel, gasoline, and TRPH were not reported in shallow soil at depths greater than 2 feet bgs.

### 4.23.1.4 TARGET ANALYTE LIST METALS

Twelve TAL metals (aluminum, antimony, barium, beryllium, cobalt, copper, lead, manganese, mercury, nickel, silver, and zinc) were reported above background concentrations in shallow soil at Site 13. Metals were reported above background at all the sampling locations. Lead was the metal most often reported above background concentration. In six samples, including the surface samples from 13\_25B211S, 13\_GN1, 13\_GN2, 13\_GN3, and 13\_SA3, and the 2-foot-bgs sample from 13\_SA1, lead was the only metal reported above background. The highest lead concentration at Site 13 was 250 mg/kg (16.6 times background) in the surface sample from 13\_SA3. No metals were reported at concentrations above background in shallow-soil samples collected at 10 feet bgs.

### 4.23.1.5 PESTICIDES

Five pesticides, endosulfan sulfate (5.77 µg/kg), 4,4'-dichlorodiphenyldichloroethane (DDD) (6.69 µg/kg), 4,4'-dichlorodiphenyltrichloroethane (DDT) (12.5 µg/kg), delta-hexachlorocyclohexane (BHC) (5.03 µg/kg), and endrin ketone (5.2 µg/kg) were reported in the 5-foot-bgs sample from 13\_DBMW49. Pesticide analyses were not performed on samples from any of the other soil borings at Site 13.

## 4.23.2 Units 1 and 2: Summary of Nature and Extent

VOCs, SVOCs and PAHs, petroleum hydrocarbons, pesticides, and TAL metals (above background concentrations) were reported in shallow soil throughout Units 1 and 2. While VOCs were reported sitewide in shallow soil samples collected throughout the

#### Section 4 Nature and Extent of Contamination

---

0- to 10-foot-bgs shallow-soil interval, SVOCs and PAHs, petroleum hydrocarbons, pesticides, and TAL metals above background were confined to the upper 5 feet of the shallow-soil interval. With the exception of one 5-foot sample from Unit 1 and one 2-foot sample from Unit 2, the reported SVOCs and PAHs were confined to surface soil at Site 13. Similarly, petroleum hydrocarbons were confined to shallow soil at depths of 0 to 2 feet bgs with the exception of a single 5-foot sample from Unit 1. TAL metals at concentrations above their respective background levels were also confined to the upper 5 feet of the shallow-soil interval. Because pesticides were reported at a depth of 5 feet bgs at the single location where samples were analyzed for this class of chemicals, their distribution at Site 13 could not be determined.

## Section 5

# FATE AND TRANSPORT

---

This section contains the fate-and-transport analysis for Site 13. It includes a discussion of the physical and chemical changes that may occur to contaminants present at the site and a discussion of mechanisms that could potentially transfer the contaminants off-site.

Section 5.1 introduces the Site 13 conceptual model. This model provides an understanding of the present site conditions by incorporating site-specific physical characteristics, nature and extent of contaminants in the physical system, and potential migration pathways. The pathways analysis is detailed in Section 5.1.3.

Section 5.2 presents a brief discussion of the fate of the contaminants identified at Site 13. Included in this section is a listing of the analytes identified at Site 13 and their mobility and persistence in the environment. A discussion of fate for each group of the analytes identified at the OU-3A sites is presented in Section 5 of the main body of this report and is not reiterated in this attachment. Section 5 of the main body of this report also discusses the physical and chemical properties of contaminants that affect contaminant transport and persistence in the environment.

Section 5.3 presents a discussion of transport pathways, and it evaluates the potential of each pathway to transport contaminants off-site.

### 5.1 CONCEPTUAL MODEL

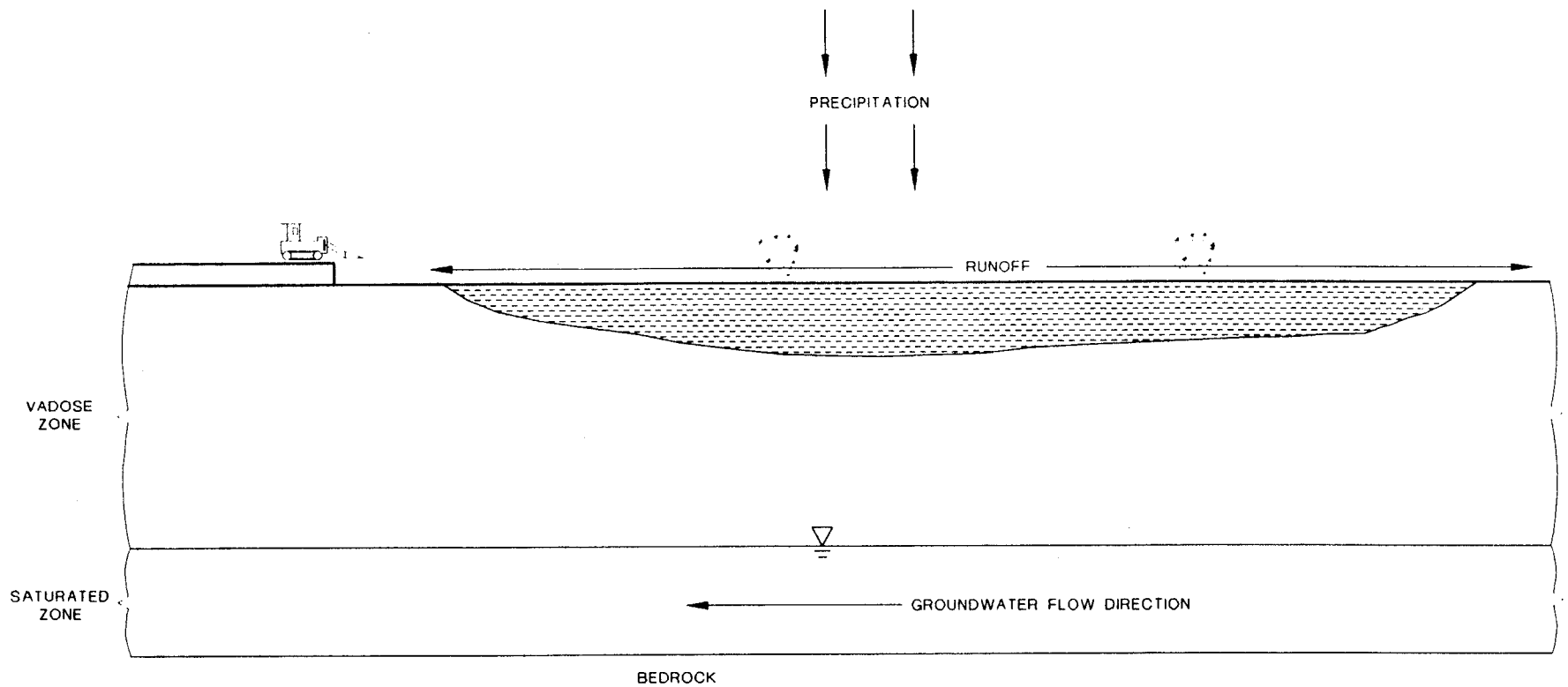
This section summarizes the pertinent geologic/hydrogeologic and surface drainage characteristics that influence the fate and transport of chemicals reported at Site 13. The section also summarizes the distribution of the chemicals in the physical system. These site-specific characteristics are used to develop the potential migration pathways analysis, which completes the site-specific conceptual model (Figure 5-1).

#### 5.1.1 Physical Characteristics of the Site

Based on a review of the RI boring logs, the subsurface lithology at Site 13 consists of moderately to well-graded clayey to silty sand that is interbedded with sandy silt and clay. These sediments have moderate-to-high porosity and low permeability. The soil at Site 13 develops on nearly flat floodplain deposits and is typically a well-drained soil characterized by slow surface runoff and a slight erosion hazard due to the nearly flat surface.

The principal aquifer is present at a depth of approximately 135 feet bgs at Site 13. The regional groundwater flow direction in the area of the site is generally to the west-northwest. The hydraulic gradient in the area of the site has been influenced strongly by the pumping of irrigation wells located west of MCAS El Toro.

The mean annual rainfall at MCAS El Toro is approximately 12.2 inches, most of which occurs from November through April. Due to the low average-annual rainfall and high evapotranspiration rates, net infiltration from precipitation is low (less than 5 inches per year) (BNI 1996a). Surface flow is induced only during significant rainfall events.



**LEGEND:**

RECEPTORS:



WORKERS



CONTAMINATED SOIL

PATHWAYS:



GROUNDWATER



DUST

OU-3A Remedial Investigation Report

**Figure 5-1**

Conceptual Site Model  
Site 13 - Oil Change Area

MCAS, El Toro, California



**Bechtel National, Inc.**  
CLEAN II Program

Date: 11/5/96  
File No: 079M1615  
Job No: 22214-079  
Rev No: C

NOT TO SCALE

## Section 5 Fate and Transport

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From March through October, the prevailing wind is from the west and averages 6 knots. From November through February, the prevailing wind is from the east and averages 4 knots. Strong, dry, gusty, offshore winds (locally known as Santa Ana winds) are common during the late fall and early winter. Due to the typically dry conditions and persistent winds, unpaved areas of the site may be subject to light-to-moderate wind erosion.

The site is located in the northwest quadrant of MCAS El Toro. The site is bounded by former Tank Farm No. 2 to the north, parking apron PA5 to the south and east, and an open asphalt area to the west. The surface of Site 13 is unpaved and generally unvegetated. Unit 1 includes small areas with weathered asphalt and spotty grass coverage. There are some small shrubs in Unit 2.

There is no obvious surface drainage direction from Site 13; however, storm drains near Site 13 discharge into Bee Canyon Wash. This drainage is a potential pathway for movement of contaminants~~analytes~~ in association with suspended particulates or as solutes or colloids in surface-water runoff.

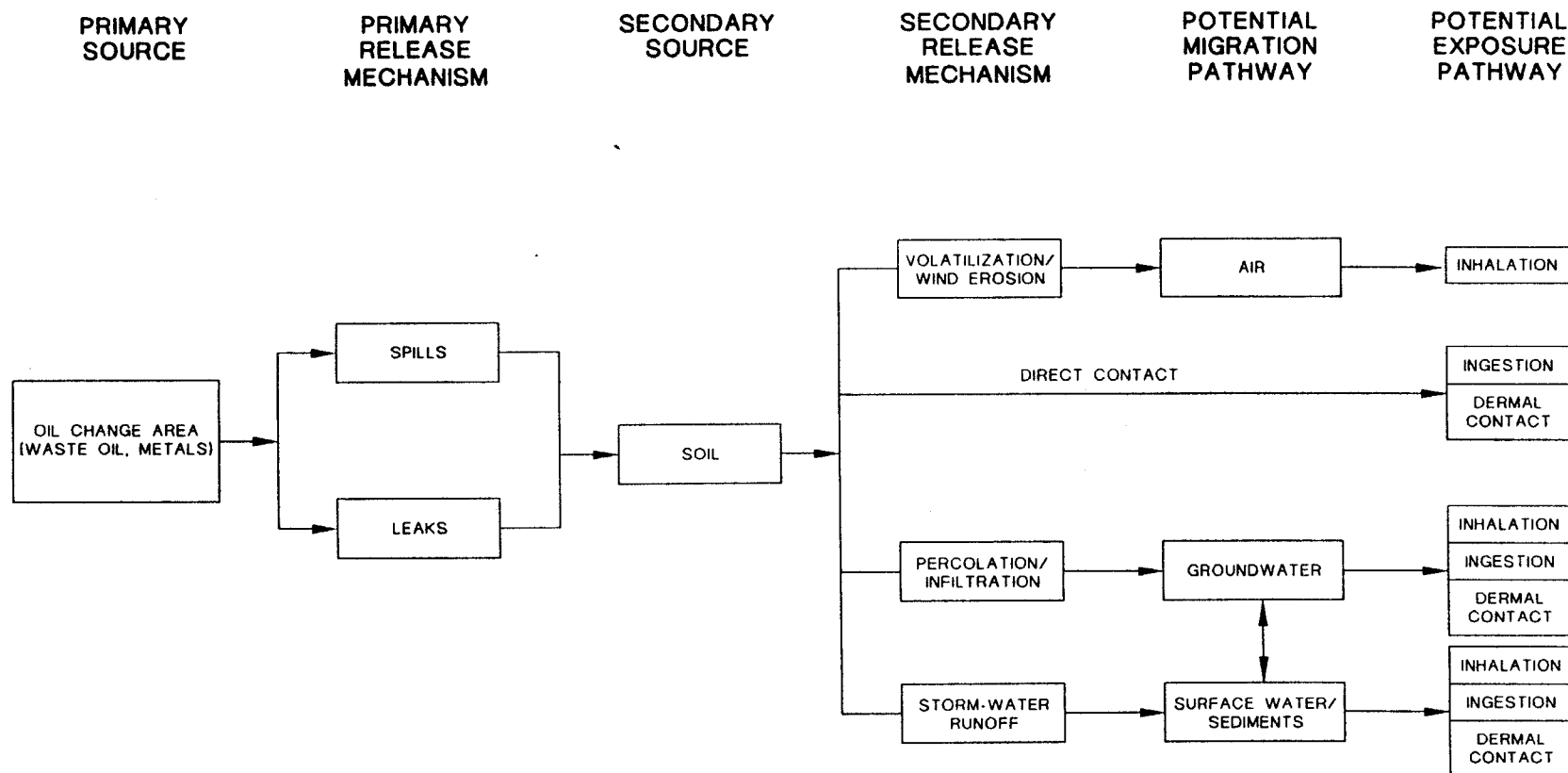
### 5.1.2 Distribution of Contaminants

VOCs, SVOCs (including PAHs), pesticides, petroleum hydrocarbons, and TAL metals were reported in soil samples collected at Site 13. VOCs were reported at low concentrations (less than 125 µg/kg) in shallow soil in samples collected to 10 feet bgs. SVOCs and PAHs were reported primarily in surface samples. Five pesticides were reported in a single sample collected at 5 feet bgs. Petroleum hydrocarbons were most prevalent in surface soil but were reported in shallow soil to depths of 5 feet bgs. Metals were reported at concentrations above background in all of the shallow-soil samples collected at depths to 5 feet bgs. Lead was the metal most often reported above background.

### 5.1.3 Potential Migration Pathways

The primary source of contamination at Site 13 was drainage of crankcase oil directly onto the ground. This activity is documented by the historical aerial photographic record.

The potential migration pathways at Site 13 are transport via air, surface water, or soil infiltration (Figure 5-2). Airborne contaminants can be transported in association with fugitive dust or by volatilization directly to the air. Transportation of airborne contaminants through volatilization is expected to be negligible at this site, because only three VOCs were reported at low (less than ~~125~~50 µg/kg) concentrations in shallow-soil samples from Site 13. Unpaved areas of the site are most susceptible to generation of fugitive dust. The transport of dust through air is affected by wind speed and direction and weather conditions.



OU-3A Remedial Investigation Report

**Figure 5-2**

Potential Migration Pathways  
Site 13 - Oil Change Area

MCAS, El Toro, California



**Bechtel National, Inc.**  
CLEAN II Program

Date: 10/30/96  
File No: 079C1616  
Job No: 22214-079  
Rev No: B

## Section 5 Fate and Transport

Waterborne contaminants ~~analytes~~ can be transported in association with suspended particulates or as solutes or colloids in the surface-water itself. Surface-water transport is affected by the amount of rainfall, type of contaminant, surface properties, and the topography of the area. The surface-water transport pathway allows movement of contaminants ~~analytes~~ off-site to the surrounding area.

Contaminants ~~Analytes~~ in surface soil can be leached downward through the soil profile along with infiltration. Due to low net infiltration prevalent at the site, transport of contaminants through soil by this pathway is expected to be negligible. Analytical results indicating that impacted soil is limited to less than 10 feet bgs support this interpretation.

## 5.2 CONTAMINANT MOBILITY AND PERSISTENCE

Contaminant mobility refers to the tendency of a contaminant to move along a pathway in response to a driving force. Contaminant persistence refers to the tendency of a chemical to resist transformation or degradation. ~~An analyte~~ contaminant that is immobile and persistent in the environment tends to remain in place. The tendency toward immobility and persistence is a function of site-specific characteristics and the physical and chemical properties of the analytes. To facilitate discussion of contaminant persistence, OU-3A contaminants have been listed by chemical group in Table 5-1 of the main body of this report. As summarized in Section 5.2 of the main body of this report, each chemical group has similar physicochemical properties that influence contaminant persistence or mobility in the environment. The following subsections summarize the mobility and persistence of the groups of chemicals identified at Site 13.

### 5.2.1 Organic Compounds

The mobility and persistence of organic compounds is governed by their physicochemical properties and the transformation mechanisms that act on them. The following sections discuss the properties of the organic compounds that were identified at Site 13. Table 5-1 addresses the mobility and persistence of benzo(a)pyrene, the ~~primary~~selected organic compounds identified at Site 13.

#### 5.2.1.1 VOLATILE ORGANIC COMPOUNDS

VOCs were reported in low concentrations in surface and shallow-soil samples at Site 13. Due to the low (less than 125 µg/kg) concentrations, VOCs are not addressed further.

#### 5.2.1.2 SEMIVOLATILE ORGANIC COMPOUNDS

PAHs were the predominant class of SVOCs reported at Site 13. This may be due to the more persistent character of these compounds in the natural environment. As a chemical group, PAHs have low water solubility and a high affinity for sorption to organic matter (high organic carbon-to-water partitioning coefficient [ $K_{oc}$ ]). Low water solubility and strong sorption to soil particles limit the relative importance of leaching through soil as a transport process and causes them to be relatively immobile.



**Table 5-1**  
**Estimates of Mobility<sup>a</sup> and Persistence of Benzo(a)pyrene Selected Organic Compounds at Site 13**

Analytes	$K_{oc}^b$ (L/kg) <sup>c</sup>	Low Percent Sorbed <sup>d</sup>	High Percent Sorbed <sup>e</sup>	Half-Life in Soil <sup>f</sup> (in years)
<b>Semivolatile Organic Compounds</b>				
Benzo(a)pyrene	5.50E+06	100	100	1.45E+00

Source: Howard 1990  
Howard et al. 1991  
Mackay et al. 1992  
U.S. EPA 1996

Notes:

- <sup>a</sup> mobility proportional to percent sorbed:  $K_{oc}f_{oc} / (1 + K_{oc}f_{oc}) \times 100$  (Karickhoff et al. 1979)
- <sup>b</sup>  $K_{oc}$  – organic carbon-to-water partitioning coefficient (Mackay et al. 1992)
- <sup>c</sup> L/kg – liters per kilogram
- <sup>d</sup> based on a low total organic carbon fraction of 1.03E-04 for OU-3A soil data
- <sup>e</sup> based on a high total organic carbon fraction of 6.13E-03 for OU-3A soil data
- <sup>f</sup> the most conservative value cited in the reference is listed; half-life listed is for microbially mediated degradation in soil (Howard et al. 1991)

In the shallow soil, biodegradation is the most important transformation process affecting the persistence of PAHs. ~~Another potentially important transformation process, photolysis, is limited to areas where surface soils are exposed to sunlight.~~ The persistence of PAHs is due to their resistance to biodegradation. This resistance is proportional to molecular weight and the number of polar functional groups attached to the PAH aromatic ring structure. High-molecular-weight, multiringed PAHs that do not contain polar functional groups (e.g., pyrene) are the most resistant to biodegradation. As such, they remain in soils for significantly longer periods of time than lower-molecular-weight PAHs composed of fewer aromatic rings (e.g., naphthalene).

### 5.2.1.3 PESTICIDES

The mobility of pesticides is greatly affected by adsorption to organic matter in soil as detailed in Section 5 of the main report. These compounds have moderate to very high  $K_{oc}$  values, resulting in a strong affinity to the organic matter in the soil and causing them to be relatively immobile. Pesticides also resist transformation processes that can degrade some chemicals, causing them to persist in the soil. As a result, these chemicals are found in surface soils at Site 13.

### 5.2.2 Metals

Like organics, the transport of metals through the environment is strongly influenced by partitioning between soil and water. The partitioning is affected by the form in which a metal is present in solution, several soil properties and a complex set of interactions between the metals in solution and soil. The partitioning behavior of a metal is expressed

## Section 5 Fate and Transport

quantitatively as a distribution coefficient ( $K_d$ ). This is discussed in detail in Section 5 of the main report. Table 5-2 addresses the mobility of selected metals identified in soil at Site 13. The  $K_d$  values presented in Table 5-2 for arsenic and manganese correspond to the range of soil pH and percent clay content reported for soils at MCAS El Toro. A review of the analytical data and the site conditions suggest that metals above background in shallow soil are not likely to leach downward through the soil profile at this site. Mobility estimates based on these  $K_d$  values predict that a high percentage of the metals are sorbed to the soil, even those soil horizons containing a relatively low percentage of clay. This suggests that metals above background levels in the shallow soil are not likely to be leached downward through the soil profile at this site.

**Table 5-2**  
**Mobility<sup>a</sup> of Selected Metals at Site 13**

Metals	$K_d^b$ (L/kg) <sup>c</sup>			PERCENT SORBED		
	< 10 percent <sup>d</sup> Clay	10-30 percent Clay	> 30 percent Clay	< 10 percent Clay	10-30 percent Clay	> 30 percent Clay
Arsenic	5.86	19.4	19.4	85	95	95
Manganese	16.5	25.3	36.9	94	96	97

Source:  
Streng and Peterson 1989

Notes:

- <sup>a</sup> mobility is proportional to percent sorbed:  $K_d/(1 + K_d) \times 100$
- <sup>b</sup>  $K_d$  – distribution coefficient
- <sup>c</sup> L/kg – liters per kilogram
- <sup>d</sup> percent clay is total weight percent composition of the clay fraction including layered silicates, iron and aluminum oxyhydroxides, and organic matter

## 5.3 CONTAMINANT MIGRATION

The potential migration pathways from Site 13 are depicted on the conceptual model (Figure 5-1). The potential migration pathways relevant to this site include surface-water transport and fugitive-dust airborne transport.

### 5.3.1 Surface-Water Transport

Surface-water runoff and sediment transport of contaminated soils may occur at Site 13, resulting in sediment transport to the storm drains that discharge into Bee Canyon Wash. However, the impact to the local environment and the receiving waters from Site 13 is expected to be minimal because:

- the concentrations of chemicals reported in shallow soil are generally low;

- significant rainfall events that produce overland flow and transport of sediment are infrequent (12.2 inches of annual rainfall over a 6-month period); and
- the surface relief of Site 13 is generally flat.

### **5.3.2 Atmospheric Transport**

Contaminated surface soils are subject to mobilization by wind erosion and fugitive-dust transport. However, the stable condition of the surface in the area of the contaminated surface soils at Site 13 is expected to minimize the potential for mobilization of contaminants by this transport mechanism. Climatic conditions existing most of the year at the site, coupled with the soil characteristics, result in dry, stable, hard-ground surface soil at Site 13. Wind speeds are light to moderate in the region and are generally insufficient to cause erosion or transport of contaminated soils.

## Section 6

# HUMAN-HEALTH RISK ASSESSMENT

---

This section briefly describes the approach used to estimate risk and summarizes the baseline risk assessment results for MCAS El Toro, Site 13, Oil Change Area. In addition, a qualitative uncertainty evaluation identifies and characterizes the effects of uncertainties on the risk results. Supplementary information is presented in Appendix K.

For the purposes of this risk assessment, Units 1 and 2 as defined by the Phase I RI were combined into a single area of potential concern to aid in the identification and definition of important source areas at Site 13. Combining the two units is appropriate because they are contiguous. Furthermore, both units were used for the same purpose (i.e., changing oil for trucks) and therefore contain the same types of contaminants.

Section 24 of this attachment contains a detailed discussion of the sampling locations, sampling rationale, and types of chemical analyses performed, ~~and~~ Results of the analyses are presented in Section 4.

The baseline risk assessment was conducted in accordance with the Phase II Risk Assessment Work Plan (BNI 1995c), the Technical Memorandum Revised Risk Assessment Procedures (BNI 1996b), and subsequent discussions with the California Environmental Protection Agency (Cal-EPA), Department of Toxic Substances Control, and U.S. EPA. The work plan and the Technical Memorandum Revised Risk Assessment follow the guidelines published by U.S. EPA in the Risk Assessment Guidance for Superfund: Part A (U.S. EPA 1989) and Part B (U.S. EPA 1991) and supporting documents and guidelines published by Cal-EPA (1992).

## 6.1 CHEMICALS OF POTENTIAL CONCERN

Chemicals of potential concern (COPCs) are the chemicals used to characterize the risk. This section identifies the chemicals selected as COPCs and identifies them by area of potential concern for Site 13. The frequency of detection, detection limits, and concentration range are presented in Appendix K. Section 6 of the main body of this report presents an overview of the data evaluation process used to select the COPCs for human health.

### 6.1.1 Soil Data

The identification of COPCs in soil at the area of potential concern at Site 13 (Units 1 and 2) was based on surface data collected at 0 to 2 feet bgs and shallow soil data collected at 0 to 10 feet bgs. Analytes reported in soil samples collected below 10 feet bgs are not included in the COPC list, because no exposure pathway is complete for these analytes. Section 6.2 discusses the soil interval selection criteria.

Only Phase I RI data from samples collected within the site boundaries were used to identify the COPCs at the area of concern at Site 13. Information on the surface soils was obtained from 14 samples, whereas information on shallow soils was obtained from 21 samples. Soil sampling locations and associated samples used in the human-health risk assessment are listed in Table 6-1.

**Table 6-1**  
**Samples Used in the Risk Assessment for Site 13**

Station ID	Sample ID	Date Collected
<b>SURFACE SOIL (0 – 2 feet bgs*)</b>		
<b>Units 1 and 2</b>		
13_25B211S	S1454220	08/20/92
13_DBMW49S	S1454236	08/20/92
13_GN1	S1454227	08/25/92
13_GN1	S1454228	08/25/92
13_GN2	S1454230	08/20/92
13_GN2	S1454231	08/20/92
13_GN3	S1454233	08/20/92
13_GN3	S1454234	08/20/92
13_SA1	S1454221	08/25/92
13_SA1	S1454222	08/25/92
13_SA2	S1454224	08/20/92
13_SA2	S1454225	08/24/92
13_SA3	S1454156	08/20/92
13_SA3	S1454157	08/24/92
<b>SHALLOW SOIL (0 – 10 feet bgs*)</b>		
<b>Units 1 and 2</b>		
13_25B211	S1456205	08/04/92
13_25B211	S1456206	08/04/92
13_25B211S	S1454220	08/20/92
13_DBMW49	S1456201	07/13/92
13_DBMW49	S1456202	07/13/92
13_DBMW49S	S1454236	08/20/92
13_GN1	S1454227	08/25/92
13_GN1	S1454228	08/25/92
13_GN2	S1454230	08/20/92
13_GN2	S1454231	08/20/92
13_GN2	S1454232	08/20/92
13_GN3	S1454233	08/20/92
13_GN3	S1454234	08/20/92
13_SA1	S1454221	08/25/92
13_SA1	S1454222	08/25/92
13_SA2	S1454224	08/20/92
13_SA2	S1454225	08/24/92

(table continues)

Section 6 Human-Health Risk Assessment

**Table 6-1** (continued)

Station ID	Sample ID	Date Collected
13_SA2	S1454226	08/24/92
13_SA3	S1454156	08/20/92
13_SA3	S1454157	08/24/92
13_SA3	S1454158	08/24/92

Note:

- \* bgs – below ground surface

Nineteen analytes were identified as surface-soil COPCs, and 30 analytes were identified as shallow-soil COPCs. All organic analytes identified in the surface soil were also present in the shallow soil. Concentrations of metals in soil were statistically compared with background concentrations to identify site-related COPCs. The statistical approach was based on a comparison of maximum detected on-site concentrations to the 95th percentile of the background data and use of the Wilcoxon Rank Sum test and the Quantile test to analyze the hypothesis that on-site concentrations are less than or equal to background concentrations (Appendix D). Thus, the metals selected were unique to each soil sample data set (i.e., silver was identified as a COPC for the shallow soil; however, it was not identified for the surface soil). Inorganic nutrients (calcium, iron, magnesium, potassium, and sodium) were excluded as COPCs. Table 6-2 presents the chemicals identified at Site 13.

Analyses of soil samples produced a small number of organic compounds classified as TICs. Chemical analytical methods approved by U.S. EPA for site investigations are designed to identify and quantify a specific suite of chemicals. When chemicals that are not part of the suite are identified, they are classified as TICs. It should be noted that the names and reported concentrations of the TICs can be inaccurate. TICs may be assigned a specific name (e.g., heptadecane) or a descriptive name (e.g., C<sub>10</sub>-C<sub>30</sub> hydrocarbon).

The majority of the TICs at Site 13 are hydrocarbons typically associated with petroleum products. The TICs found in the soil and their highest measured concentrations are shown in Table 6-3. None of these TICs is a common priority pollutant, and there are few or no toxicological data available. Where TICs and target analytes were found together in a medium, there were fewer TICs than target analytes, and the sum of the highest measured concentrations of the TICs amounted to a very small percentage of the sum of the highest measured concentrations of the target analytes. Hence, the TICs were not included as COPCs. The positively identified organic COPCs were considered adequate to address the risks at Site 13.

**Table 6-2**  
**COPCs<sup>a</sup> Evaluated in the Risk Assessment for Site 13**

<b>Chemical</b>	<b>Shallow Soil (0 – 10 feet bgs<sup>b</sup>) Units 1, 2</b>	<b>Surface Soil (0 – 2 feet bgs) Units 1, 2</b>
<b>Volatile Organic Compounds</b>		
2-butanone	X	
Acetone	X	X
Phenanthrene	X	X
Toluene	X	X
<b>Semivolatile Organic Compounds</b>		
Benzo(a)pyrene	X	X
Benzo(b)fluoranthene	X	X
Benzo(g,h,i)perylene	X	X
Benzo(k)fluoranthene	X	X
bis(2-ethylhexyl)phthalate	X	X
Butyl benzyl phthalate	X	X
Chrysene	X	X
Fluoranthene	X	X
Indeno(1,2,3-c,d)pyrene	X	X
Pyrene	X	X
<b>Pesticides and Polychlorinated Biphenyls</b>		
4,4'- DDD <sup>c</sup>	X	
4,4'- DDT <sup>d</sup>	X	
delta-BHC <sup>e</sup>	X	
Endosulfan sulfate	X	
Endrin ketone	X	
<b>Metals</b>		
Aluminum	X	
Arsenic	X	
Barium	X	X
Cadmium		X
Chromium	X	X
Cobalt	X	
Copper	X	
Lead	X	X
Manganese	X	
Silver	X	
Vanadium	X	X
Zinc	X	X

(table continues)

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**Table 6-2 (continued)**

Notes:

- <sup>a</sup> COPC – chemical of potential concern
- <sup>b</sup> bgs – below ground surface
- <sup>c</sup> DDD – dichlorodiphenyldichloroethane
- <sup>d</sup> DDT – dichlorodiphenyltrichloroethane
- <sup>e</sup> BHC – hexachlorocyclohexane

**Table 6-3**  
**TICs<sup>a</sup> Detected at Site 13**  
**(micrograms per kilogram)**

CAS <sup>b</sup> No.	Chemical	Number	Minimum	Maximum
<b>Surface Soil (0 – 2 feet bgs<sup>c</sup>) Units 1 and 2</b>				
00123-42-2	4-hydroxy-4-methyl-2-pentanone,	1	3,100	3,100
<b>Shallow Soil (0 – 10 feet bgs) Units 1 and 2</b>				
00123-42-2	4-hydroxy-4-methyl-2-pentanone,	1	3,100	3,100

Notes:

- <sup>a</sup> TIC – tentatively identified compound
- <sup>b</sup> CAS – Chemical Abstract Service
- <sup>c</sup> bgs – below ground surface

### 6.1.2 Air Data

Conservatively, volatile COPCs for air were identified from the surface soil VOC data. Soil particulate COPCs were also identified from soil samples. Soil chemicals other than the VOCs were identified as air particulate COPCs. Appendix K presents the air modeling methodology.

## 6.2 EXPOSURE ASSESSMENT

An exposure assessment identifies the populations at potential risk and the mechanisms by which members of these populations could be exposed to the COPCs in each medium. It also is a process by which the chemical concentrations at the point of exposure and the chemical doses are calculated. Section 6 of the main body of this report describes the exposure scenarios, the hypothetical receptors, the methodology used to quantify exposure for each pathway, and the reasons for selection of each pathway. The following sections describe the exposure setting at Site 13, identify the hypothetical receptors for the site, and discuss the exposure-point concentrations for the COPCs at each area of potential concern.



## 6.2.1 Receptor Analysis

MCAS El Toro is currently being used as a military air base, and its land use can be classified as industrial. Site 13 encompasses approximately three quarters of a one-fourth acre north of Building 242 in the southwest corner of MCAS El Toro. The site is bounded on the north by Tank Farm No. 2 and by the storage yard for Building 242 to the south. The site consists of two units: Unit 1, Area Southeast of Tank Farm (approximately 17,300 square feet); and Unit 2, Area Southwest of Tank Farm (approximately 16,800 square feet). For the purposes of this risk assessment, these units were combined into one area of potential concern based on common historical activities, their locations relative to one another, the nature and magnitude of the chemical contaminants, and the physiographic characteristics of the units.

For Site 13, the most likely population at risk under current conditions was identified as base personnel. However, as presented in Section 6 of the main body of this report, MCAS El Toro as part of BRAC will be closed in 1999. MCAS El Toro will be turned over to Orange County following closure. Draft reuse plans have been formulated and indicate the Station will remain an airport. To provide risk managers with a margin of safety when making cleanup decisions, exposure conditions used in the estimation of current and future risk were deliberately chosen to overestimate risk. Risk was evaluated for Site 13 using industrial and residential land-use scenarios, even though residential use is considered unlikely even in the distant future.

The industrial land-use scenario allows the assessment of risk due to exposure to COPCs in surface soil. The residential scenario allows the assessment of risk due to exposure to COPCs in shallow soil. Exposure for the industrial worker and resident was assessed as being greater than for any other potential receptor. These receptors were considered more of a possibility than individuals exposed occasionally or irregularly to chemicals at a site (i.e., someone engaged in the construction of buildings and other structures). Therefore, risks to the industrial worker and the resident were the only risks quantified.

## 6.2.2 Exposure Pathways

Exposure pathways are the means by which a receptor can come into contact with the COPCs. Pathway identification is based on information corresponding to land use and the physical properties of the COPCs. Section 6 of the main body of this report identifies the exposure pathways evaluated for the residential and industrial receptors at the OU-3A sites along with the scenarios upon which the exposure pathways for each receptor are based.

## 6.2.3 Exposure-Point Concentration

An exposure-point concentration is the concentration of a chemical in the contaminated medium at the point of contact with a receptor. Analyte concentrations reported detected in surface soil (0 to 2 feet bgs) were used for the office worker, because it is unlikely that routine daily activities of that receptor would result in exposure to chemicals in deeper

## Section 6 Human-Health Risk Assessment

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soil. For the resident, analyte concentrations ~~reported~~detected in shallow soil to 10 feet bgs were used in the estimation of exposure-point concentrations.

Following the criteria described in Section 6 of the main body of this report, both 95 percent upper confidence limits (UCLs) and maximum concentrations were used as exposure-point concentrations for the COPCs in surface and shallow soil at the area of potential concern (Units 1 and 2). The procedure for calculating an exposure-point concentration tends to use the maximum detected concentration in cases of relatively few samples or low frequency of detection. Appendix K describes the procedures used to calculate the 95 percent UCLs and identifies the statistical distribution of each chemical.

Some of the Site 13 analytes identified as COPCs (metals, PAHs, and pesticides) were also ~~reported~~detected in background or reference samples. Metals are natural components of the earth's crust. Pesticides, such as DDT, dichlorodiphenyldichloroethene (DDE), and DDD are found throughout the United States because of their widespread use. PAHs are encountered in the soils of industrial areas, and their presence has been reported in surface soils in the vicinity of vehicular traffic. The background study for MCAS El Toro (BNI 1996c) presents the metals and pesticides identified at the background or reference locations and their measured concentrations. The PAH reference-level study performed for soils at MCAS El Toro under CTO-0065 (BNI 1996d) was used to identify reference concentrations for the PAHs.

For these chemicals, a comparison between their on-site and background or reference levels provides additional information to be used by risk managers in reaching site-specific decisions. Appendix K presents the exposure-point concentrations for background metals, PAHs, and pesticides. The 95 percent UCL or the maximum concentration, as appropriate, was used as the exposure-point concentration for metal, PAH, and pesticide COPCs measured in soil background or reference levels.

### 6.2.4 Estimation of Dose Rate

Dose rate is the amount of chemical to which a receptor is exposed per unit of body weight and time. Dose rates were estimated by integrating intake variables (e.g., ingestion rate, body weight, and exposure duration) with the contaminant concentration. The combination of all intake variables results in an estimate of exposure for each pathway. The specific equations for each exposure scenario and the values assigned to the equation parameters are provided in Appendix K. Exposure assumptions describing the rate of contact that the industrial and residential receptors could have with the soil are presented in Section 6 of the main body of this report.

## 6.3 TOXICITY ASSESSMENT

The toxicity assessment consisted of identifying oral and inhalation toxicity criteria (cancer slope factors [CSFs] and reference doses [RfDs]) for each of the chemicals chosen for inclusion in the risk assessment and the kinds of effects these chemicals are capable of producing. The toxicity factors are combined with the chronic daily dose to calculate a numerical estimate of risk (Section 6.4 in the main report). Section 6 of the main

body of this report presents the source of toxicity criteria, identifies toxicity values developed by Cal-EPA for a group of eight carcinogens, and identifies the toxicity criteria used for dermal exposures. Toxicity criteria for the COPCs identified for the OU-3A sites at MCAS El Toro and the chemicals without toxicity criteria and their chemical surrogates are tabulated in Appendix K.

The assessment of the risk presented by lead consisted of first comparing the concentration of lead in surface and shallow soils at the areas of potential concern of Site 13 to the industrial and residential Cal-EPA preliminary remediation goal (PRG) of 1,000 and 130 mg/kg, respectively. For the shallow soils, the comparison is based on the residential Cal-EPA PRG instead of the U.S. EPA PRG (400 mg/kg), because the Cal-EPA PRG is lower and more stringent, rendering the approach conservative. The lead concentration reported for the surface and shallow soil at Site 13 is below both the Cal-EPA industrial and residential soil PRGs.

Upon completion of a risk assessment, it is not uncommon to find that only a small percentage of the chemicals evaluated contribute appreciably to total risk. Those chemicals are conventionally called risk drivers. In this risk assessment, risk and hazard drivers are defined as COPCs that present a cancer risk of at least  $1 \times 10^{-6}$  or an HI of at least 1.0. COPCs with cancer risk estimates less than  $1 \times 10^{-6}$  or HIs less than 1.0 are also classified as risk/hazard drivers when the sum of their risk estimates or HIs exceeds  $1 \times 10^{-6}$  or 1.0, respectively. The risk drivers at Site 13 include arsenic, benzo(a)pyrene, and manganese. Appendix K presents the Integrated Risk Information System files for the COPCs identified as risk drivers. Information about the receptors and pathways through which the risk drivers posed the highest risk are presented in the next section.

## 6.4 RISK CHARACTERIZATION

The final step in any risk assessment is the characterization of risk in which the exposure and toxicity information generated in previous sections is integrated to evaluate the potential health risks. The methods used in the estimation of risk are presented in Section 6 of the main body of this report. The following text provides the resultant risk estimates, summarized in Tables 6-4 and 6-5, for the industrial and residential receptors, respectively. In addition, the text identifies the COPCs (risk drivers) accounting for most or all of the total cancer and noncancer risk.

For the carcinogens, two estimates of cancer risk are given for each receptor, as shown in Figure 6-1. The first estimate is based exclusively on U.S. EPA CSFs, and the second is based on U.S. EPA CSFs with Cal-EPA CSFs substituted for certain chemicals (see Section 6 of the main body of this report). Note that both risk estimates are presented even though the COPCs at the area of potential concern may not include any of the eight chemicals for which a Cal-EPA CSF has been assigned. In such cases, the two estimates of total cancer risk are identical.

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**Table 6-4**  
**Summary of Cancer Risk and Chronic Hazard Index, Industrial Use, Site 13**

Exposure Pathway	Cancer Risk U.S. EPA <sup>a,b</sup>	Cancer Risk California State <sup>b</sup>	Hazard Index
<b>Units 1 and 2</b>			
Incidental dermal contact	5.0E-06	8.2E-06	0.0049
Dust inhalation	9.5E-09	2.0E-08	0.0026
Incidental ingestion	3.3E-07	5.5E-07	0.0044
Vapor inhalation	NA <sup>c,d</sup>	NA <sup>d</sup>	0.0000025
<b>Units 1 and 2 Total</b>	<b>5.3E-06<sup>e</sup></b>	<b>8.8E-06<sup>f</sup></b>	<b>0.012</b>

Notes:

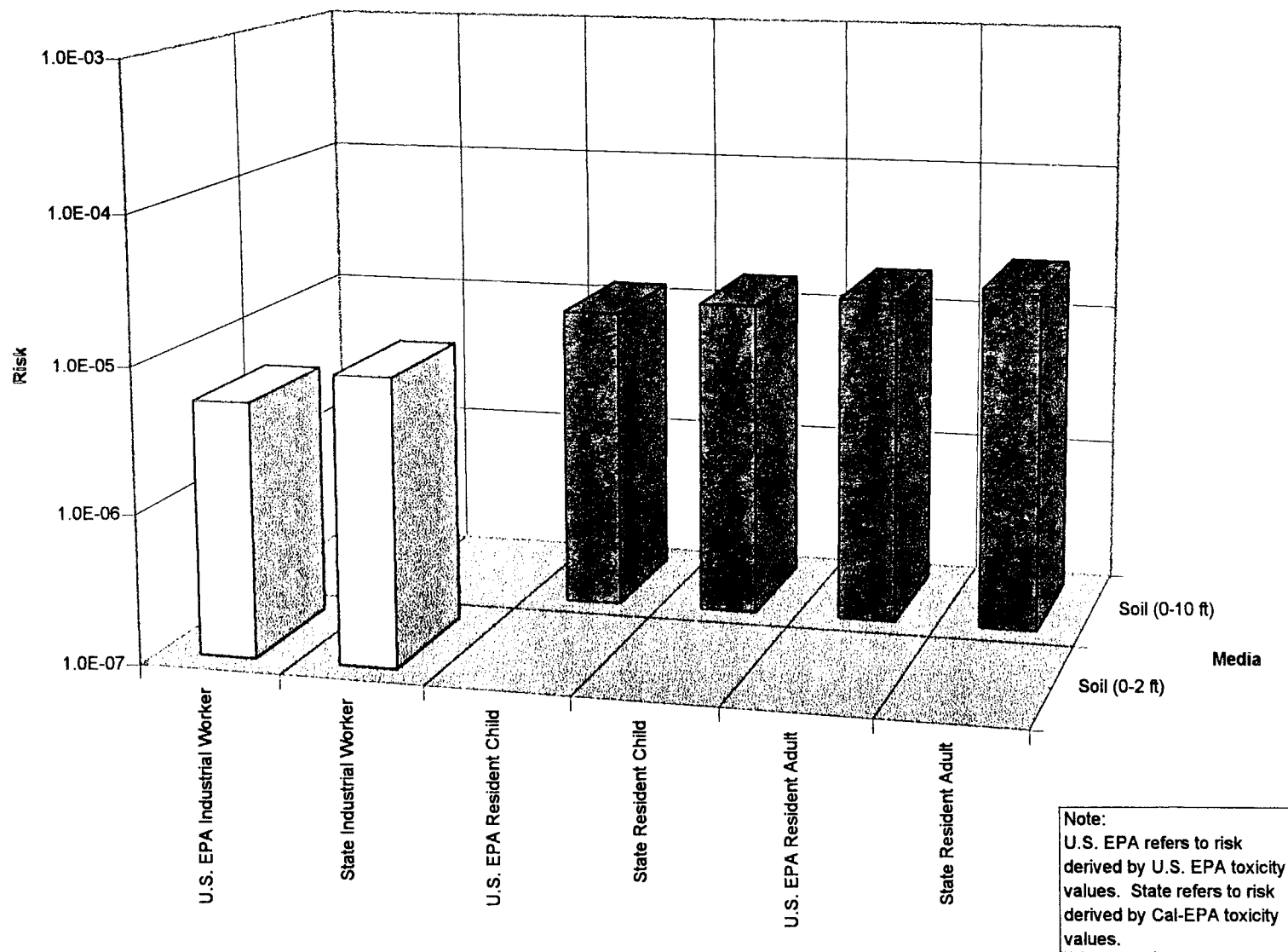
- <sup>a</sup> U.S. EPA – United States Environmental Protection Agency
- <sup>b</sup> risk was calculated by using U.S. EPA or California Environmental Protection Agency toxicity values
- <sup>c</sup> NA – not applicable
- <sup>d</sup> risk was not quantifiable; volatile organic compounds were noncarcinogenic
- <sup>e</sup> the majority of the risk is due to dermal contact and incidental ingestion of benzo(a)pyrene (81 percent)
- <sup>f</sup> the majority of the risk is due to dermal contact and incidental ingestion of benzo(a)pyrene (80 percent)

**Table 6-5**  
**Summary of Cancer Risk and Chronic Hazard Index, Residential Use, Site 13**

Exposure Pathway	Cancer Risk U.S. EPA <sup>a,b</sup>	Cancer Risk California State <sup>b,c</sup>	Hazard Index <sup>d</sup>
<b>Units 1 and 2</b>			
Incidental dermal contact	7.4E-06	1.1E-05	0.073
Dust inhalation	2.9E-07	2.9E-07	0.53
Incidental ingestion	1.0E-05	1.2E-05	0.45
Vapor inhalation	NA <sup>e,f</sup>	NA <sup>f</sup>	0.000016
<b>Units 1 and 2 Total</b>	<b>1.8E-05<sup>g</sup></b>	<b>2.3E-05<sup>h</sup></b>	<b>1.1<sup>i</sup></b>

Notes:

- <sup>a</sup> U.S. EPA – United States Environmental Protection Agency
- <sup>b</sup> risk was calculated by using U.S. EPA or California Environmental Protection Agency toxicity values
- <sup>c</sup> the risk is higher for the resident adult, therefore only the resident adult risk results are shown
- <sup>d</sup> the index is higher for the resident child, therefore only the resident child indices are shown
- <sup>e</sup> NA – not applicable
- <sup>f</sup> risk was not quantifiable; volatile organic compounds were noncarcinogenic
- <sup>g</sup> the majority of the risk is due to incidental ingestion and dermal contact of arsenic (53 percent) and dermal contact and incidental ingestion of benzo(a)pyrene (36 percent)
- <sup>h</sup> the majority of the risk is due to dermal contact and incidental ingestion of benzo(a)pyrene (48 percent) and incidental ingestion and dermal contact of arsenic (42 percent)
- <sup>i</sup> the majority of the index is due to dust inhalation and incidental ingestion of manganese (53 percent)



**Figure 6-1**  
**Summary of Lifetime Cancer Risk Estimates by Receptor at Site 13 (Units 1 and 2)**

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The cancer risk for the adult resident is higher than that for the child resident. Therefore, to simplify the presentation of the results, this section is limited to the discussion of the adult cancer risks (Table 6-5). Appendix K presents the cancer risks quantified for both residential receptors. Figure 6-2 illustrates the risk associated with each on-site exposure pathway. Figure 6-3 shows the COPCs identified as risk drivers at Site 13.

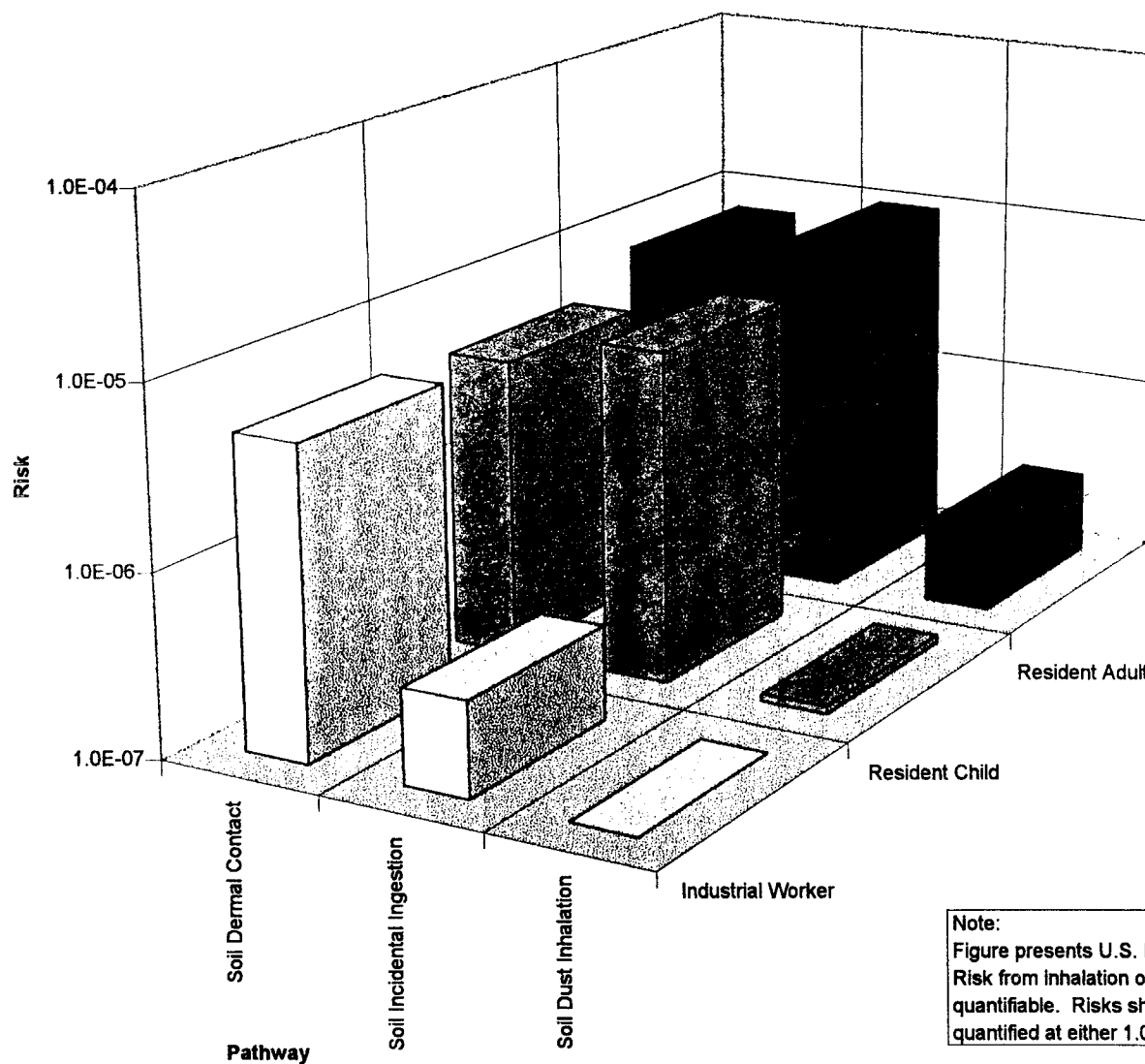
The results of the industrial worker and residential noncancer risk (hazard index [HI]) and the hazard evaluation of lead are also presented in this section. For the resident receptor, noncancer risk estimates discussed in the text are the higher of the child or the adult estimate (the noncancer risk estimates for the child resident are higher than those for the adult resident). Appendix K presents the noncancer risks quantified for both residential receptors. Figure 6-4 presents the HI for each receptor at Site 13. Figure 6-5 illustrates the HI associated with each exposure pathway. Figure 6-6 shows the COPCs contributing to the majority of the HI.

A limitation of the HI is that the assumption of dose additivity is most properly applied to compounds that induce the same effect by the same mechanism of action. Consequently, the HI could be overestimated by a cumulative HI due to a number of chemicals that are not expected to induce the same type of effect. Thus, for the HIs exceeding unity (Units 1 and 2 under the residential land use scenario), COPCs were segregated by effect and separate HIs were derived specific to each effect group (Table 6-6).

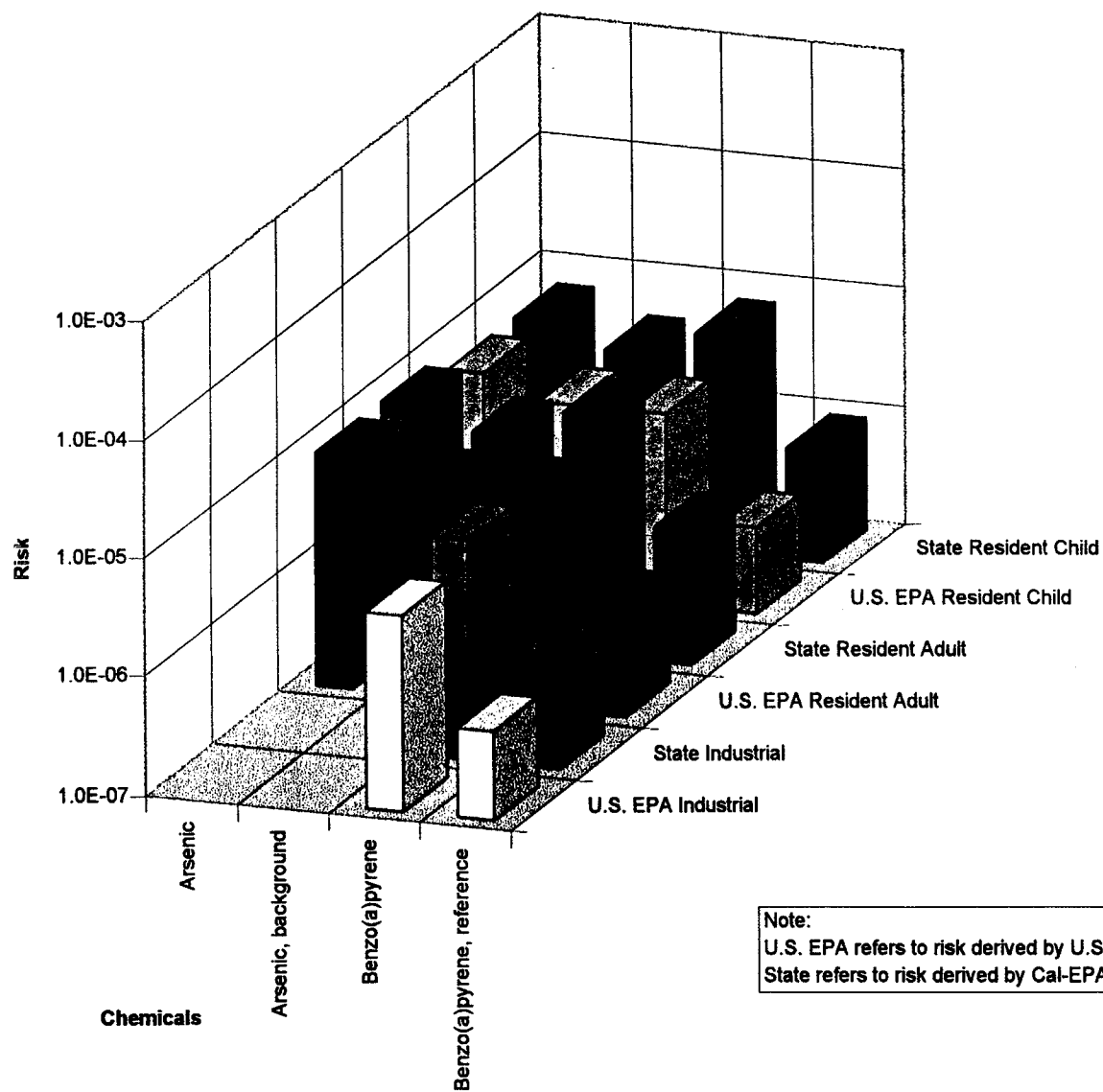
### 6.4.1 Units 1 and 2

#### 6.4.1.1 INDUSTRIAL USE

The excess lifetime cancer risk to an industrial worker exposed to surface soils (0 to 2 feet bgs) at Units 1 and 2 was estimated at  $5.3 \times 10^{-6}$  and  $8.8 \times 10^{-6}$  by using U.S. EPA and Cal-EPA toxicity criteria, respectively. Dermal contact is the dominant risk pathway (Table 6-4). The risk is primarily associated with benzo(a)pyrene. This chemical is classified by U.S. EPA as a probable human carcinogen (Group B2), which means that there is sufficient evidence that it is carcinogenic in laboratory animals, but there is insufficient evidence of carcinogenicity in humans. For additional perspective, a background or reference cancer risk was also estimated for the naturally occurring metals and anthropogenic chemicals (i.e., PAHs and pesticides) identified as COPCs at Site 13. A comparison between on-site and background or reference level risks provides useful information to risk managers in the context of decisions to be made about selection of remedies. Cancer risk due to benzo(a)pyrene is approximately eight times higher on-site than at reference levels. Appendix K presents the risk estimates quantified for all metal and anthropogenic COPCs detected at background locations. The HI at this area is less than 1.0, indicating that systemic toxicity is unlikely. The risk for lead is considered negligible based on a comparison of the Cal-EPA industrial PRG for lead (1,000 mg/kg) and the 95 percent UCL for lead (200 mg/kg at the surface soil of Site 13, Units 1 and 2).

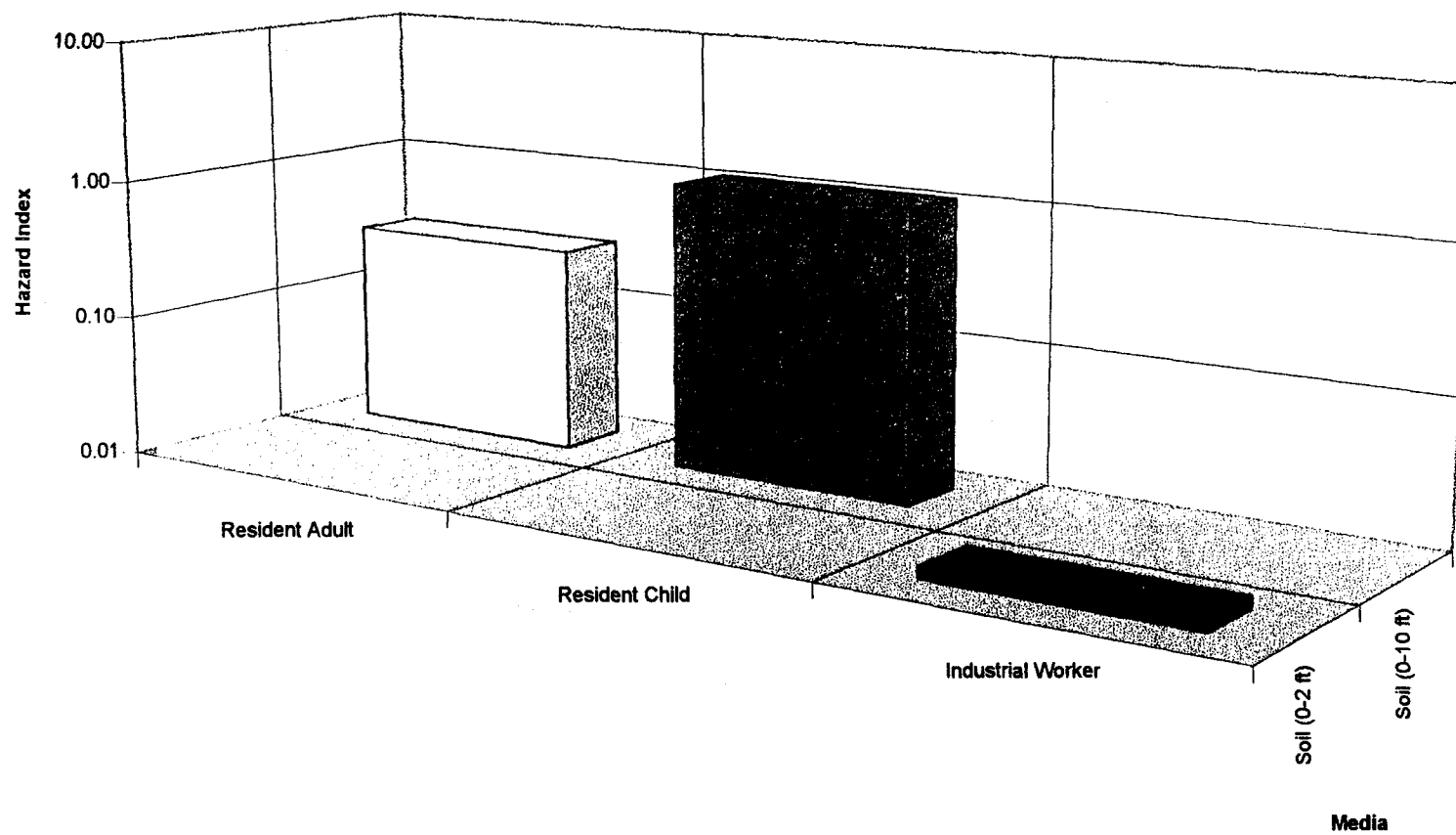


**Figure 6-2**  
**Summary of Carcinogenic Risk by Pathway at Site 13 (Units 1 and 2)**

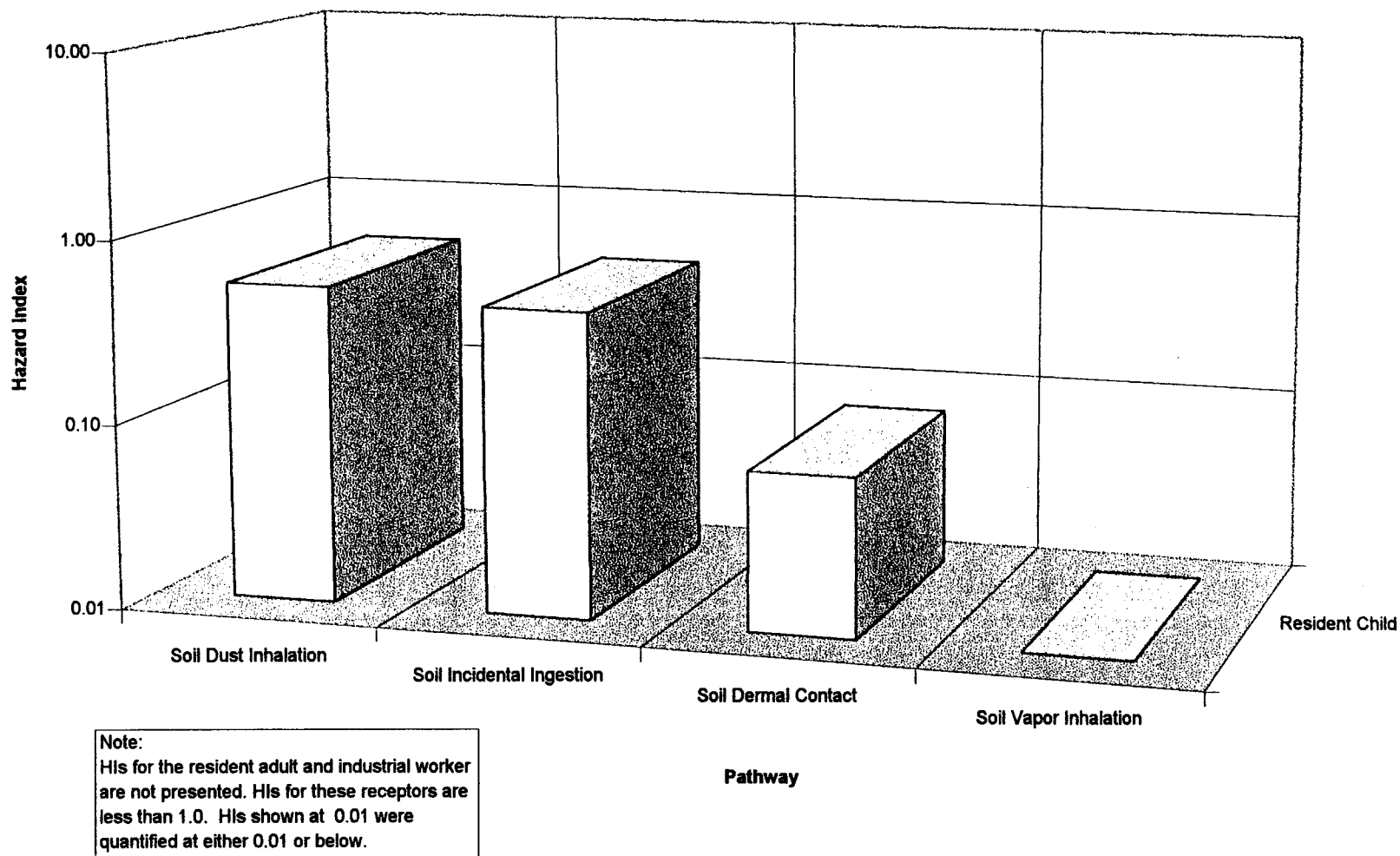


**Figure 6-3**  
**Lifetime Cancer Risks of the Risk Drivers for Soils at Site 13 (Units 1 and 2)**

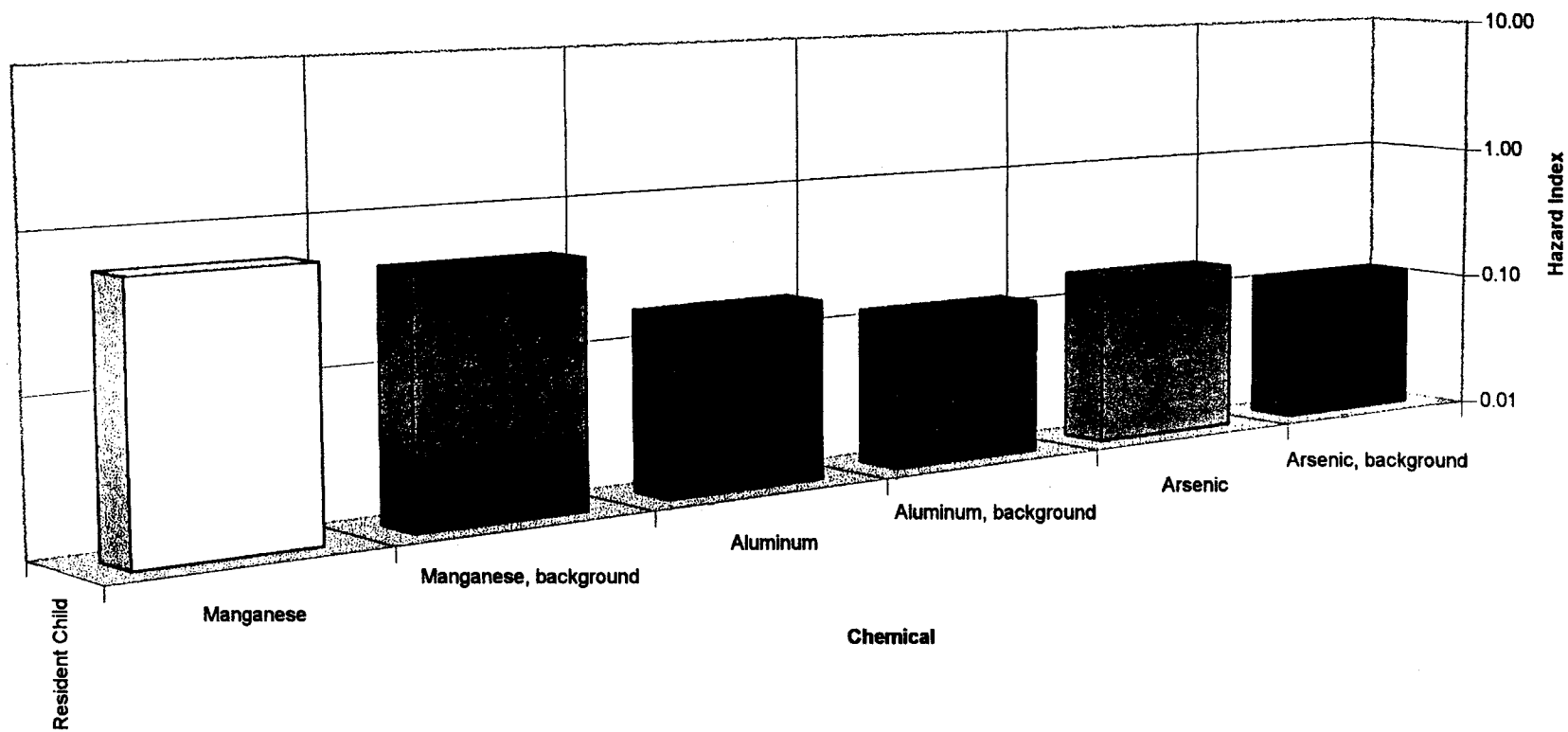




**Figure 6-4**  
**Chronic Hazard Index by Receptor at Site 13 (Units 1 and 2)**



**Figure 6-5**  
**Chronic Hazard Index by Pathway at Site 13 (Units 1 and 2)**



Note:  
 HIs for the resident adult and the industrial worker are not presented. HIs for these receptors are less than 1.0.  
 Aluminum and arsenic are not considered risk drivers, but are included for comparison.

**Figure 6-6**  
**Hazard Indices of the Risk Drivers for Soil at Site 13 (Units 1 and 2)**

**Table 6-6**  
**Chronic Hazard by Specific Effect**  
**Site 13 Units 1 and 2 Residential Use**

Chemical	Kidney Toxicity	Liver Toxicity	Neurotoxicity Effects	Dermal Effects	Respiratory Effects	Hematological Effects	Cardiovascular Effects	Gastrointestinal Effects	Ocular Effects	Reproductive Effects	Developmental Effects	Immunological Effects	Hazard Quotient for All Effects
<b>Units 1 and 2</b>													
Aluminum	— <sup>a</sup>	—	1.70E-01	—	1.70E-01	—	—	—	—	1.70E-01	—	—	1.70E-01
Arsenic	—	1.60E-01	1.60E-01	1.60E-01	1.60E-01	1.60E-01	1.60E-01	1.60E-01	—	1.60E-01	1.60E-01	—	1.60E-01
Barium and compounds	—	—	5.90E-02	—	5.90E-02	—	5.90E-02	5.90E-02	—	5.90E-02	5.90E-02	—	5.90E-02
Benzo(a)pyrene	—	—	—	—	—	1.70E-04	—	—	—	1.70E-04	1.70E-04	1.70E-04	1.70E-04
Benzo(b)fluoranthene	2.10E-04	2.10E-04	2.10E-04	2.10E-04	—	2.10E-04	—	2.10E-04	2.10E-04	2.10E-04	—	—	2.10E-04
delta-BHC <sup>b</sup>	4.30E-04	4.30E-04	—	—	—	—	—	—	—	—	—	—	4.30E-04
bis(2-ethylhexyl)phthalate (DEHP)	3.50E-04	3.50E-04	3.50E-04	—	—	3.50E-04	—	—	—	3.50E-04	3.50E-04	—	3.50E-04
Chromium III and compounds	—	—	—	—	—	—	—	—	—	—	1.70E-04	—	1.70E-04
Chrysene	—	—	—	—	—	—	—	—	—	—	—	1.70E-04	1.70E-04
Cobalt	—	—	—	1.90E-03	1.90E-03	—	—	—	—	—	—	—	1.90E-03
Copper and compounds	3.40E-03	3.40E-03	3.40E-03	—	3.40E-03	3.40E-03	3.40E-03	3.40E-03	3.40E-03	3.40E-03	3.40E-03	—	3.40E-03
4,4'-DDD <sup>c</sup>	—	3.40E-04	—	—	—	—	—	—	—	—	—	—	3.40E-04
4,4'-DDT <sup>d</sup>	—	6.40E-04	—	—	—	—	—	—	—	—	—	—	6.40E-04
Endrin ketone	—	4.40E-04	4.40E-04	—	—	—	—	—	—	—	—	—	4.40E-04
Fluoranthene	2.60E-04	2.60E-04	—	—	—	2.60E-04	—	—	—	—	—	—	2.60E-04
Indeno(1,2,3-c,d)pyrene	1.80E-04	1.80E-04	1.80E-04	1.80E-04	—	1.80E-04	—	1.80E-04	1.80E-04	1.80E-04	—	—	1.80E-04
Manganese and compounds	—	—	5.80E-01	—	5.80E-01	5.80E-01	—	5.80E-01	—	5.80E-01	—	5.80E-01	5.80E-01
Pyrene	2.90E-04	2.90E-04	—	—	—	2.90E-04	—	—	—	—	—	—	2.90E-04
Silver and compounds	6.70E-04	—	6.70E-04	6.70E-04	6.70E-04	—	6.70E-04	6.70E-04	6.70E-04	—	—	—	6.70E-04
Vanadium	7.60E-02	7.60E-02	7.60E-02	—	7.60E-02	7.60E-02	—	7.60E-02	—	—	—	—	7.60E-02
Zinc	2.80E-03	—	—	2.80E-03	2.80E-03	2.80E-03	—	2.80E-03	—	2.80E-03	2.80E-03	2.80E-03	2.80E-03
<b>Cumulative Effect Total</b>	<b>8.46E-02</b>	<b>2.43E-01</b>	<b>1.05E+00</b>	<b>1.66E-01</b>	<b>1.05E+00</b>	<b>8.248.27E-01</b>	<b>2.24E-01</b>	<b>8.828.84E-01</b>	<b>4.46E-03</b>	<b>9.76E-01</b>	<b>2.26E-01</b>	<b>5.83E-01</b>	<b>1.061.1E+00</b>

**Notes:**

- <sup>a</sup> — — not analyzed
- <sup>b</sup> BHC — hexachlorocyclohexane
- <sup>c</sup> DDD — dichlorodiphenyldichloroethane
- <sup>d</sup> DDT — dichlorodiphenyltrichloroethane

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### 6.4.1.2 RESIDENTIAL USE

Exposure to shallow soils (0 to 10 feet bgs) by a hypothetical resident resulted in an excess lifetime cancer risk estimated at  $1.8 \times 10^{-5}$  and  $2.3 \times 10^{-5}$  using U.S. EPA and Cal-EPA toxicity criteria, respectively. Incidental ingestion is the dominant risk pathway (Table 6-5). Similarly to the industrial scenario, the risk at this area is primarily associated with arsenic and benzo(a)pyrene. Arsenic is classified by the U.S. EPA as a human carcinogen (Group A), which means that there is sufficient evidence to show that it causes cancer in humans. The cancer risk due to these chemicals at Units 1 and 2 is approximately 1.5 and 8 times higher, respectively, than at background/reference levels.

The HI for a hypothetical resident child exposed to shallow soils at Units 1 and 2 is 1.1. Dust inhalation was the dominant noncancer risk pathway. The majority of the HI is due to manganese. Prolonged exposure to elevated levels of manganese either orally or by inhalation provokes disturbances to the central nervous system. Symptoms progress from headache, insomnia, and memory loss to symptoms similar to those of Parkinson's disease. Effects on reproduction have been observed in humans after inhalation exposure and in animals after oral exposure. After segregating the HI by major systemic effects (Table 6-6), several of the effect-specific HIs exceeded unity (1.0), indicating a potential for systemic toxicity. These results, however, should not be taken as absolute indicators of risk since the mechanism of action by which compounds produce adverse effects on the same organ system was not considered. The HI for manganese at Units 1 and 2 is approximately 1.3 times higher than the HI at background. The risk for lead is considered negligible based on a comparison of the Cal-EPA residential PRG for lead (130 mg/kg) and the 95 percent UCL for lead (77.8 mg/kg at the shallow soil of Site 13, Units 1 and 2).

### 6.4.2 Discussion

For future industrial workers at Site 13 Units 1 and 2, cancer risk was quantified at 5.3E-06 and the cumulative HI is less than 1.0. Cancer risk for future residents at these units is 1.8E-05 and the cumulative HI is slightly greater than 1.0. At this area, the HI for individual systemic toxic effects exceeds 1.0 for neurotoxicity and respiratory effects. This exceedance is due primarily to the manganese (53 percent). However, the HI for manganese at Units 1 and 2 is only 1.3 times its HI at background. This indicates that the concentrations of manganese are not significantly different from background at Site 13 Units 1 and 2. Therefore, noncancer hazards at these units are not considered significant.

Individuals engaged in construction work were also evaluated for selection as representative receptors. The construction worker is potentially exposed to the same 0- to 10-foot-bgs shallow-soil interval as the on-site resident. Long-term exposure for residents at the site is assessed as being greater than exposure for someone performing construction work over a short time. Construction work would be infrequent and its duration is assumed to be 1 year or less. Furthermore, excavation activities would be covered by regulations promulgated by the California Occupational Safety and Health

Section 6 Human-Health Risk Assessment

Administration and incidental exposure to chemicals in the soil is unlikely. Therefore, risks to the hypothetical site resident were quantified while risks to the utility maintenance worker were qualitatively assessed.

Cancer risk to a 70-kilogram construction worker with an exposed skin surface area of 5,000 square centimeters, a soil ingestion rate of 480 mg/day, an inhalation rate of 1.25 cubic meters/hour, an exposure duration of 1 year, and an exposure frequency of 250 days would be quantified at least 7 times less than the risk to the resident adult. Noncancer risk to a 70-kilogram construction worker would be quantified at least 10 times less than the risk to the resident child.

To place the cancer and noncancer risk estimates in proper perspective, the data and the context in which they were used to calculate these estimates inherent uncertainties in the numerical results must be evaluated. ~~The frequency of detection (number of measurable detections/number of samples analyzed) was generally low to moderately low for the organic COPCs and high for the inorganic COPCs in both surface and shallow soil.~~ Of particular interest is the organic cancer risk driver, benzo(a)pyrene. This COPC was ~~reported~~detected in only one sample at the surface (sampling station 13\_25B211S) at a concentration of 0.211 mg/kg. For this risk driver, this ~~reported~~detected value was used as the exposure-point concentration for both surface and shallow soil. Several other COPCs were similarly evaluated on the basis of highest measured concentrations. It is important to note that the assumption of long-term contact with the maximum concentration is conservative, and the use of maximum concentrations in the risk assessment results in overestimates of exposures and risks. Section 6 of the main body of this report presents the major uncertainties associated with the use of the maximum concentration in the risk assessment.

The qualifiers associated with ~~reported~~detected concentrations of benzo(a)pyrene indicate uncertainty in the reported values. Some ~~reported concentrations~~detects for the organic analytes are qualified as "J" by the data validators. Concentrations indicated by the "J" qualifier are estimated quantities and below the detection limit. Therefore, the risk results presented for Site 13 should not be taken as a characterization of absolute risk. Conclusions by risk managers about the significance of the risk will need to integrate the uncertainties affecting the risk estimates.

As presented in the previous section, a background or reference level cancer and noncancer risk was also estimated for the metals and anthropogenic chemicals (i.e., PAHs and pesticides) identified as Site 13 COPCs. The comparison between the on-site and background levels provides additional information to be used by risk managers in reaching site-specific decisions. The more significant difference between on-site and background risk (i.e., reference level) estimates is associated with the organic COPCs. Comparable on-site and background risk estimates were quantified for the inorganic COPCs. On-site background risk estimates suggest that arsenic, one of the principal cancer risk drivers, and manganese, the noncancer risk driver, may not be a result of site-specific releases or contamination. There is no known historical site activity that used arsenic or manganese. It is possible that arsenic compounds may have been used for

## Section 6 Human-Health Risk Assessment

agricultural or pest-control practices prior to construction and expansion of MCAS El Toro. The earliest insecticides developed for use against chewing insects were arsenic-containing formulas, chiefly copper acetoarsenite (Paris green), lead arsenate, and calcium arsenate. Sodium arsenite has been used as a sterilant herbicide and a potato vine killer. Sodium arsenate was formerly the toxicant in many ant syrups for household use. These applications were superseded because of hazard to man and animals (Meister 1991).

Other arsenic-containing herbicides and pesticides that could have been used at the station include Arsenal, arsenic acid, arsenic trioxide, cacodylic acid, calcium acid methanearsonate, calcium arsenate, calcium arsenite, disodium methanearsonate, monoammonium methanearsonate, and monosodium methanearsonate. These herbicides and pesticides were used typically to control weeds in industrial areas such as utility plant sites and petroleum tank farms and in baits to control insects and animals (Meister 1991). It is possible that such chemicals were used for these purposes at MCAS El Toro. By contrast, the organic COPC risk driver (benzo[a]pyrene) is likely to be due to site activities (i.e., oil drained from heavy equipment), and its cancer risk is above reference-level risk as expected. Figure 6-3 depicts the background/reference level and the on-site cancer risk for the COPCs identified as risk drivers.

In the analysis of the above risk results, the risks were estimated for a current industrial worker and a hypothetical resident. Draft reuse plans have been formulated and indicate the Station will remain an airport. To provide risk managers with a margin of safety, the assessment assumed other land uses besides industry. ~~Therefore, this characterization includes a bias in the association between risk and the likelihood of occurrence.~~ Understanding the impacts of this uncertainty will help risk managers make better informed and reasoned risk-based decisions.

## 6.5 UNCERTAINTY ANALYSES

The estimated cancer risks and noncancer HIs presented in this risk assessment are based on numerous assumptions, most of which are considered conservative. As a result of the cumulative effect of these conservative assumptions, the estimated risks are thought to substantially overestimate actual risks. The uncertainties associated with these assumptions are presented in Section 6 of the main body of this report. This section discusses the specific uncertainties associated with the assessment of Site 13.

### 6.5.1 Data Evaluation

Sampling programs are necessarily limited in space and time. Selecting representative sampling locations and collecting a sufficient number of samples determine the success of characterizing risk at a contaminated site. Only Phase I RI data from samples collected within the site boundaries were used in the identification of the COPCs and the risk evaluation for Site 13. Phase II RI sampling was not performed at Site 13. It is believed that the Phase I RI data sufficiently characterize Site 13.



## 6.5.2 Exposure Assessment

The principal uncertainties associated with the exposure assessment are categorized by scenario assumptions and quantification of exposure-point concentrations. Section 6 of the main body of this report discusses the uncertainties relative to the exposure scenarios. Specific sources of uncertainty associated with quantification of exposure-point concentrations corresponding to Site 13 are discussed below.

For most soil COPCs, a low frequency of detection or a small sample population rendered the use of the statistically derived 95 percent UCL inapplicable, and rendered the maximum detected chemical value the appropriate estimator for the exposure-point concentration. The assumption of long-term contact with the maximum concentration is conservative, and the use of maximum concentrations in the risk assessment results in overestimates of exposures and risks. ~~However, there is some uncertainty whether risk assessments address the full magnitude of potential risks associated with those results from a small sample population.~~

~~Furthermore, in evaluating data, several assumptions were made that result in uncertainty in the risk estimate.~~ For estimating means and 95 percent UCLs on the mean, one-half the detection limit was used for results reported as undetected. Hence, the exposure-point concentrations for analytes characterized by a large number of nondetects are largely based on estimates rather than actual concentrations. "J"-qualified data were used quantitatively in the baseline human-health risk assessment and "lose" the meaning of their qualifier (i.e., the value is estimated [U.S. EPA 1989]). Some of the reported concentrations ~~detects~~ for the organic chemicals are qualified as "J" indicating uncertainty in the reported values. Therefore, the risk results presented for Site 13 should not be taken as a characterization of absolute risk.

## 6.5.3 Toxicity Assessment

Toxicity values (slope factors and RfDs) were not available for all of the chemical COPCs. Some chemicals lacking toxicity criteria were assessed quantitatively with surrogate criteria (i.e., DDD, endosulfan sulfate). Uncertainty related to lack of an RfD might result in an underestimation or overestimation of risk.

## Section 7

# CONCLUSIONS AND RECOMMENDATIONS

---

This section presents the conclusions and recommendations of the RI conducted for Site 13. Because the physical and chemical conditions within the two Site 13 units are closely related, the units were addressed as a single combined area of concern for purposes of assessing risk and the need for further action. Included in this section are brief summaries of the physical characteristics, nature and extent of contamination, fate and transport of contaminants, and results of the human-health risk assessment. These results furnish responses to DQO decisions that provided the framework for the RI at Site 13. Recommendations are presented for future actions.

## 7.1 SUMMARY

The purpose of the Phase I RI was to characterize contamination to support risk assessment and HI determinations for Site 13. No Phase II RI sampling was conducted at Site 13.

### 7.1.1 Physical Characteristics

Site 13 is located in the northwest quadrant of MCAS El Toro. The site is bounded by Tank Farm No. 2 to the north, parking apron PA5 to south and east, and an open asphalt area to the west. The terrain in the immediate vicinity of the site is relatively flat. The site consists of two units: Unit 1, Area Southeast of Tank Farm; and Unit 2, Area Southwest of Tank Farm. The two units in Site 13 have similar surface features. Both units are relatively flat, unpaved, and generally unvegetated. Unit 1 includes small areas with weathered asphalt and spotty grass coverage. There are some small shrubs in Unit 2. There is no obvious surface drainage direction from the site; however, storm drains near Site 13 discharge into Bee Canyon Wash.

### 7.1.2 Nature and Extent of Contamination

Defining the nature and extent of contamination at Site 13 is an important aspect of addressing whether further action is necessary at the site. TPH, VOCs, SVOCs, and TAL metals are present in shallow soil throughout Site 13. Pesticides were reported in shallow soil at the site, but their distribution cannot be determined because pesticide analyses were only performed on samples from a single boring. SVOCs, pesticides, and TAL metals are the primary contaminants identified at Site 13, and SVOCs and TAL metals are also the most widely distributed classes of chemicals present in shallow soil at the site. The distribution of the chemicals which drive risk, as identified in the Site 13 risk assessment, is illustrated in Figure 7-1.

### 7.1.3 Fate and Transport

The fate-and-transport analysis evaluated release mechanisms and transport pathways for Site 13. The analysis indicates that the two potential migration pathways at Site 13 are air and surface water and suggested that contaminants in soil at Site 13 are not readily

mobilized and transported off-site. Furthermore, due to the low net infiltration rates and the persistence of PAHs and metals in soil, transport of chemicals downward in the soil profile appears to be negligible.

### 7.1.4 Human-Health Risk Assessment

The risk assessment was performed to determine whether contaminants at Site 13 present a carcinogenic and/or noncarcinogenic risk to human health. The significance of cancer and noncancer risk values is discussed in Section 6.6 of the main report. The results of the human-health risk assessment are summarized as follows.

The following receptors were analyzed for human-health risk:

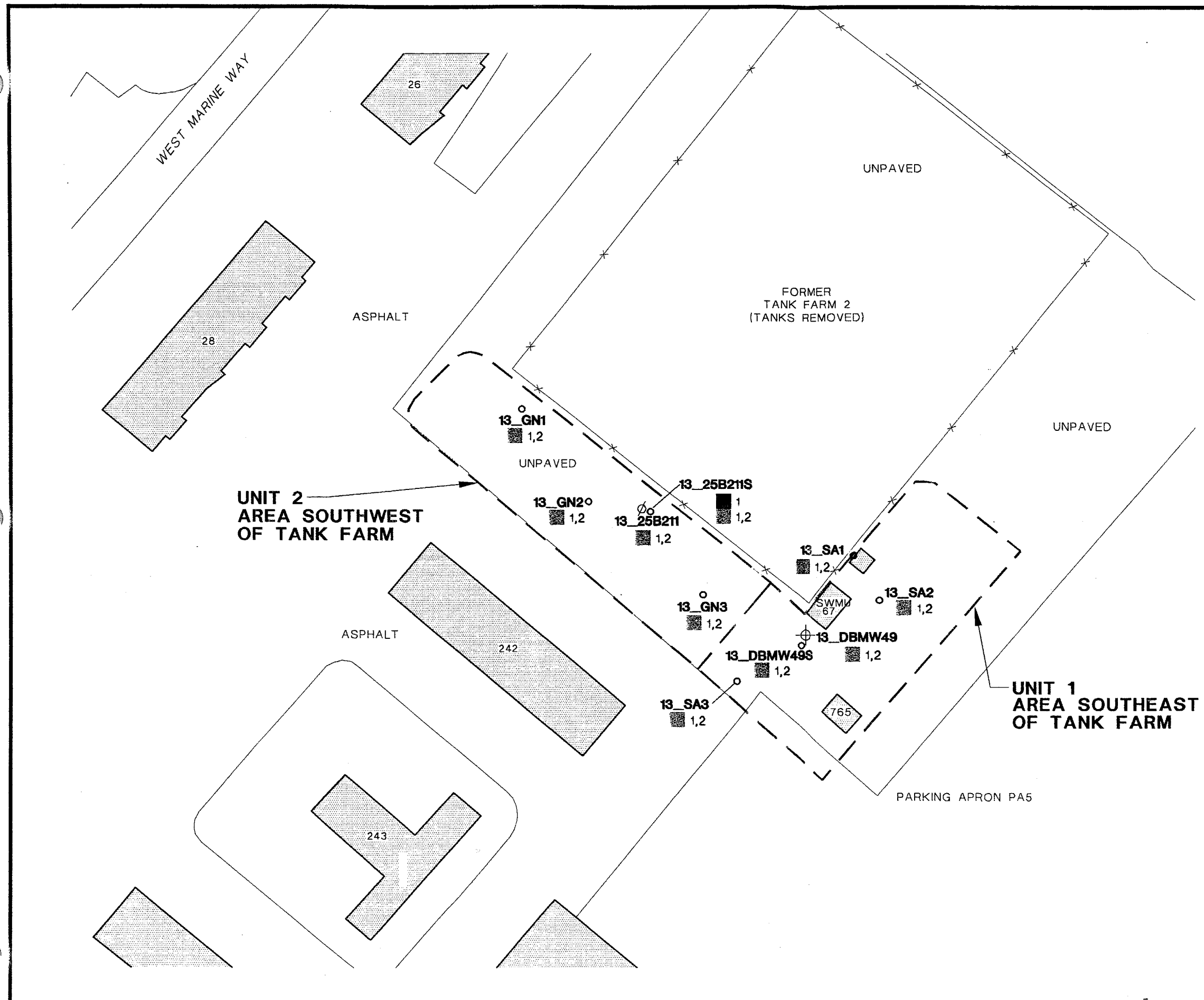
- on-site resident, and
- on-site industrial worker.

The risks associated with Units 1 and 2 are as follows:


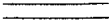


- the cancer risk for an on-site resident at Units 1 and 2 is  $1.8 \times 10^{-5}$  using U.S. EPA toxicity criteria and  $2.3 \times 10^{-5}$  using Cal-EPA toxicity criteria;
- the cancer risk for an on-site industrial worker at Units 1 and 2 is  $5.3 \times 10^{-6}$  using U.S. EPA toxicity criteria and  $8.8 \times 10^{-6}$  using Cal-EPA toxicity criteria;
- the HI for an on-site resident at Unit 1 is 1.1 using U.S. EPA toxicity criteria; and
- the HI for an on-site industrial worker at Unit 1 is 0.012 using U.S. EPA toxicity criteria.

The cancer risks estimated for future residents and industrial workers at the combined area of Units 1 and 2 are within the acceptable risk range of  $10^{-4}$  to  $10^{-6}$  as stated in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP)~~exceed  $10^{-6}$ .~~ Arsenic is responsible for more than 50 percent of carcinogenic risk at Units 1 and 2 in the residential scenario. The cancer risk due to arsenic at Site 13 is only one and one half times greater than background in the residential scenario. The arsenic concentrations at Site 13 are not attributable to known historical site activities. Possible explanations for the high arsenic concentrations at Site 13 are:




- the concentrations of arsenic in soil in the immediate vicinity of Site 13 may have a higher background concentration than the statistically calculated background concentrations of arsenic for MCAS El Toro; and
- as discussed in Section 6.4.2 of this attachment, arsenic was widely used in various herbicides and pesticides in the past. The area of MCAS El Toro was primarily agricultural prior to construction and expansion of the Station. Levels of arsenic at the site may be attributable to past agricultural or pest-control practices.







# **LEGEND:**

-  BUILDING OR PAD
-  IMPROVED ROADS
-  FENCE
-  UNIT BOUNDARY

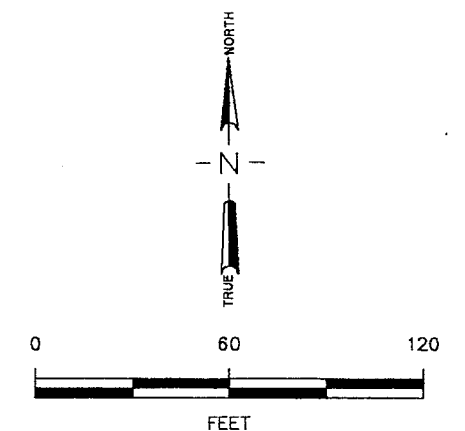
## **APPROXIMATE SAMPLING LOCATIONS**

-  PHASE I MONITORING WELL
-  PHASE I DEEP OR ANGLE BORING
-  PHASE I SURFACE AND NEAR SURFACE SOIL SAMPLE

## **RISK DRIVERS (UNDER INDUSTRIAL AND RESIDENTIAL SCENARIOS)**

-  2,3 COLOR NUMBER INDICATES CANCER RISK DRIVER
-  BLACK NUMBER INDICATES NONCANCER RISK DRIVER
-  1 PAHs:  
1 = BENZO(A)PYRENE
-  1 METALS:  
1 = ARSENIC  
2 = MANGANESE

NOTES: SWMU - SOLID WASTE MANAGEMENT UNIT



## **OU-3A Remedial Investigation Report**

### **Figure 7-1**

Distribution of Risk Drivers in Shallow Soil  
Site 13 - Oil Change Area

MCAS, El Toro, California



**Bechtel National, Inc.**  
CLEAN II Program

Date: 3/7/97  
File No: 079A1711  
Job No: 22214-079  
Rev No: C

PAGE NO. H7-4

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## Section 7 Conclusions and Recommendations

The other risk driver at Site 13 is the organic compound benzo(a)pyrene. Benzo(a)pyrene was only identified in one sample. As a result, the exposure-point concentration (the concentration used to calculate the risk) for benzo(a)pyrene in shallow soil was the one reported concentration. It is important to note that the assumption of long-term contact based on a single concentration is conservative, and the use of maximum concentrations in the risk assessment results in overestimates of exposures and risks.

The cumulative HI estimated for future industrial workers at the combined area of Units 1 and 2 is less than 1.0. Under the residential scenario at Units 1 and 2, the cumulative HI estimate is 1.1. At the combined area of Units 1 and 2 the HI for individual systemic toxic effects exceeds 1.0 for neurotoxicity and respiratory effects. This exceedance is due primarily to manganese (53 percent). However, the HI for manganese at Units 1 and 2 is only 1.3 times its HI at background. This indicates that the concentrations of manganese are not significantly different from background at Site 13 Units 1 and 2. Therefore, noncancer hazards at these units are not considered significant.

The estimated cancer and noncancer risks presented are based on numerous assumptions, most of which are conservative. As a result of the cumulative effect of these conservative assumptions, the estimated risks are thought to substantially overestimate the actual risks. ~~Furthermore, "J" qualified data were used quantitatively in the baseline risk assessment and "lose" the meaning of their qualifier. The majority of detects for the organic compounds at Site 13 were qualified as "J" indicating uncertainty in the reported values. In addition, most of these "J" qualified values are below the reported detection limit.~~

## 7.2 CONCLUSIONS

Chemicals reported in shallow soil at Site 13 do not appear to pose an unacceptable risk to a potential on-site resident (or on-site industrial worker) based upon the reported range of concentrations in shallow soil and the calculated risk values in the combined areas of Units 1 and 2. The chemicals identified in soil at Site 13 do not pose an imminent risk to human health or the environment; they are stable in the physical system and are generally immobile. The results of the habitat assessment indicated an absence of significant plant and wildlife habitat at Site 13.

### 7.2.1 Data Limitations and Recommendations for Future Work

The data collected during the Phase I RI were sufficient to characterize the nature and extent of contamination, perform human-health risk assessment, and support decisions on the necessity for remedial actions at Site 13. No future work is necessary.

### 7.2.2 Recommended Actions

Based on the Comprehensive Environmental Response, Compensation, and Liability Act (1980), NCP, and applicable or relevant and appropriate requirements, as well as the conservative nature of the risk assessment performed for this site, no remedial action is required to address contaminants at Site 13.

Section 7 Conclusions and Recommendations

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## Section 8

# REFERENCES

---

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***Appendix D***  
***Site 13 ROD***

**DRAFT FINAL  
RECORD OF DECISION  
OPERABLE UNITS 2A AND 3A  
NO ACTION SITES  
MARINE CORPS AIR STATION  
EL TORO, CALIFORNIA**

**SEPTEMBER 1997**

## DECLARATION

Date: 09/26/97

## **DECLARATION**

---

### **SITE NAME AND LOCATION**

Marine Corps Air Station (MCAS) El Toro  
Operable Unit-3A, Sites 4, 6, 9, 10, 13, 15, 19, 20, 21, and 22  
Operable Unit-2A, Site 25  
Orange County, California

### **STATEMENT OF BASIS AND PURPOSE**

This decision document presents the selected remedial action for Sites 4, 6, 9, 10, 13, 15, 19, 20, 21, 22, and 25 at MCAS El Toro in Orange County, California. The document was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the administrative record file for these sites.

The State of California (through the California Environmental Protection Agency, Department of Toxic Substances Control, and Santa Ana Regional Water Quality Control Board) and the U.S. Environmental Protection Agency concur with the selected remedy.

### **DESCRIPTION OF THE SELECTED REMEDY: NO ACTION**

The selected remedy for Sites 4, 6, 9, 10, 13, 15, 19, 20, 21, 22, and 25 is no action. In selecting the no action remedy for these sites, the Navy has determined that the existing condition of the sites is protective of human health and the environment.

Although no deed restrictions are required because of chemicals present in soils at the no action sites, shallow groundwater underlying Sites 9, 10, 13, 15, 21, 22, and portions of Site 25 is contaminated by trichloroethene and tetrachloroethene. Remedial investigations have shown that the contamination does not originate from these sites but from Site 24, the volatile organic compound source area. Use restrictions for several sites (including Site 24 and the no action sites listed above) prohibiting drilling of wells and/or extraction of groundwater and allowing access for groundwater monitoring and maintenance of equipment associated with groundwater remediation will be addressed in the Proposed Plan(s) and Record(s) of Decision for Operable Unit-1 and -2A regarding groundwater.

### **DECLARATION STATEMENT**

Based on extensive field investigations, laboratory analyses, and a thorough assessment of potential human-health risks at each location and of potential ecological risks at Site 25, the Navy has determined that no remedial action is necessary to assure the protection of human health and the environment at Sites 4, 6, 9, 10, 13, 15, 19, 20, 21, 22, and 25. The Remedial Investigations of these sites show that contamination is limited to the shallow soil interval (Sites 4, 6, 9, 10, 13, 15, 19, 20, 21, and 22) and to sediment and

## Declaration

surface water (Site 25). The human health and ecological risk assessments show that the chemicals present in these media do not present an unacceptable risk to human health or the environment. Therefore, no remedial action is required at these sites. Since hazardous substances are not present at concentrations above unacceptable levels, CERCLA Section 121 cleanup standards do not apply.

Signature: \_\_\_\_\_  
Mr. Joseph Joyce  
Base Closure and Realignment Environmental Coordinator  
Marine Corps Air Station El Toro

Date: \_\_\_\_\_

Signature: \_\_\_\_\_  
Mr. John E. Scandura, Chief  
Southern California Operations  
Office of Military Facilities  
Department of Toxic Substances Control

Date: \_\_\_\_\_

Signature: \_\_\_\_\_  
Mr. Daniel D. Opalski, Chief  
Federal Facilities Cleanup Branch  
United States Environmental Protection Agency, Region IX

Date: \_\_\_\_\_


Signature: \_\_\_\_\_  
Mr. Gerald J. Thiebeault  
Executive Officer  
Regional Water Quality Control Board, Santa Ana Region

Date: \_\_\_\_\_

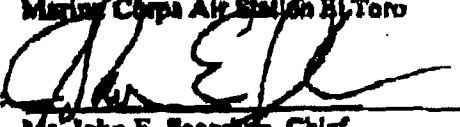
Date: 09/30/97

Declaration

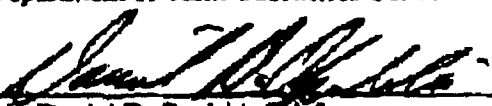
surface water (Site 25). The human health and ecological risk assessments show that the chemicals present in these media do not present an unacceptable risk to human health or the environment. Therefore, no remedial action is required at these sites. Since hazardous substances are not present at concentrations above unacceptable levels, CERCLA Section 121 cleanup standards do not apply.

Signature:   
Mr. Joseph Jeyes  
Base Closure and Realignment Environmental Coordinator  
Marine Corps Air Station El Toro


Date: Sept 23, 1997

Signature:   
Mr. John E. Seandine, Chief  
Southern California Operations  
Office of Military Facilities  
Department of Toxic Substances Control

Date: Sept. 26, 1997

Signature:   
Mr. Daniel D. Opalski, Chief  
Federal Facilities Cleanup Branch  
United States Environmental Protection Agency, Region IX

Date: 9/29/97

Signature:   
Mr. Gerald J. Thibault  
Executive Officer  
Regional Water Quality Control Board, Santa Ana Region

Date: 9/30/97

***Appendix E***  
***Site Assessment Log***



**SITE ASSESSMENT LOG**  
**MCAS EL TORO**  
**TEMPORARY ACCUMULATION AREA & RFA SITE**  
**18609, D.O. 70**

TAA SITE: 765 RFA SITE: N/A SWMU NO. 266

Field Observations by: Dharmraj Paul Date: 9/30/97

TAA area Paved or Unpaved, Concrete pad with blind sump, Roof, Surrounded by unpaved area.

Paved: Concrete or Asphalt, Condition of the Concrete/Asphalt: Minor Cracks, Stains, etc.  
Condition good. no cracks or heavy stains were observed.

Unpaved: Open on the Ground or Inside the Building N/A

Is there any Drums or any types of Waste Stored: Yes/No, If Yes, Describe:

None, empty,

Fenced: Yes/No, Sump: Yes/No, Concrete Berm: Yes/No, \_\_\_ inch, Roof: Yes/No

Describe other Structural details: TAA is within IRP Site 13 Bournaby, next to Bldg 765,  
Tank Farm 2 North of TAA, no cracks in concrete pad or beams  
TAA Decontamination and/or Demolition Possible: Yes/No

Site Setup Constrains: Equipment Operation, movement of Excavator or Backhoe N/A

Nearest Building or Structure Distance: Tank Farm 2 approximately 20 feet, North,

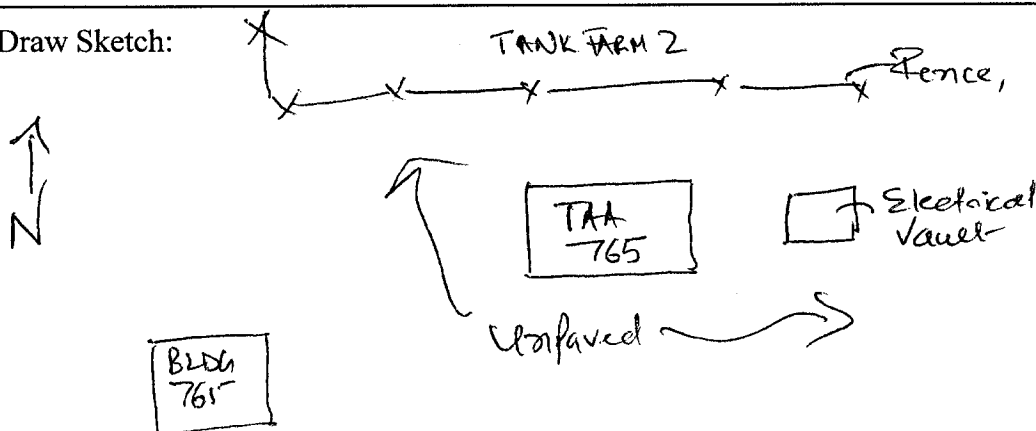
Any Underground Piping/Lines, or Transformer Observed:

Electrical Vault,

Overhead Utility Lines/Poles: Not observed

Photograph Roll No. 14 Please attach all the Photographs to this sheet.

Draw Sketch:



***Appendix F***  
***Geophysical Survey Data***

GEOPHYSICAL SURVEY RESULTS  
FOR  
SITE 765

MARINE CORPS AIR STATION, EL TORO  
SANTA ANA, CALIFORNIA

Prepared for  
  
OHM Remediation Services Corporation  
Irvine, California

Prepared by  
  
GEOVISION GEOPHYSICAL SERVICES  
1785 Pomona Road, Suite B  
Corona, California, 91720

January 17, 1997

GEOVISION JOB NUMBER: 97206

## **1.0 Introduction**

---

A geophysical investigation was carried out on January 17, 1997 for OHM Remediation Services Corporation adjacent to Building 765, located at Marine Corps Air Station (MCAS) El Toro, Santa Ana, California. The investigation was conducted to verify and accurately locate the presence of all detectable underground utilities prior to drilling in the surveyed area.

## **2.0 Field Procedures**

---

GEOVision's standard clearance procedures were used to survey the site to accurately locate underground utilities in the surrounding area. GEOVision field teams used the attached GEOPHYSICAL CLEARANCE FORM to ensure that all appropriate procedures were followed. Procedures that were not appropriate for the site were lined out.

The crew used the Metrotech utility locator in the 82 MHz mode, which picks up any conductive piping in the area, to circle the suspected utility location. One field crew member stood on or near the suspected utility location holding the transmitter, and keeping it constantly oriented on the second crew member who swept out a circle around the suspected utility location. If a line was found, the Metrotech transmitter was then placed on the suspected line while the second crew member tracked the line with the receiver. We also swept the area with the Metrotech in 60 hz mode to locate any live electrical lines. The utility lines found were marked on the ground and located on the map.

A GSSI SIR-2 digital Ground Penetrating Radar (GPR) system was used to collect GPR profiles surrounding the site. The enclosed site map shows the locations of all profiles, which were chosen to intercept utilities entering the area to be cleared. Profiles were collected using the 500 MHz antenna. A marker switch on the antenna handle was used to place 5' spaced fiduciary marks on each profile as the antenna was pulled along the profile lines. All GPR records were stored on the system's hard drive for later processing and archiving, and were printed out onsite using a portable printer. Representative GPR profiles, hand annotated by the operator in the field, are attached.

An accurate, scaled geophysical survey map was then drawn on the back of the GEOPHYSICAL CLEARANCE FORM. All anomalies found by GPR or utility locator directly in the area to be cleared were marked at the site and shown on the enclosed site map.

### 3.0 Conclusions

One unknown utility line in the vicinity of the area to be cleared was interpreted from geophysical data; it was not referenced on base maps. Water lines in the vicinity of the area to be cleared were not clearly discernible in the geophysical data. Water lines were drawn based on geophysical results from an earlier survey near building 765 and base map locations. Location of the water lines was complicated by the fact that previous survey results indicate that the water lines as built do not match the base drawings. An orange dashed line encloses the cleared area.



geophysical services  
a division of Agabian Associates

## GEOPHYSICAL CLEARANCE FORM

PROJECT NAME: OHM PROJECT NUMBER 97206  
LOCATION EL TORO MCAS  
DATE 17 JAN 97 TIME 0900  
SITE DESCRIPTION: SITE 745, CHEMICAL STORAGE BASIN w/  
ELEVATED COVER

## GEOPHYSICAL EQUIPMENT

GROUND PENETRATING RADAR (GPR) UNIT: SIR2 MAGNETOMETER: -  
ELECTROMAGNETIC (EM): - EM LINE TRACER (LT): 9320  
METAL DETECTOR (MD): - OTHER: -

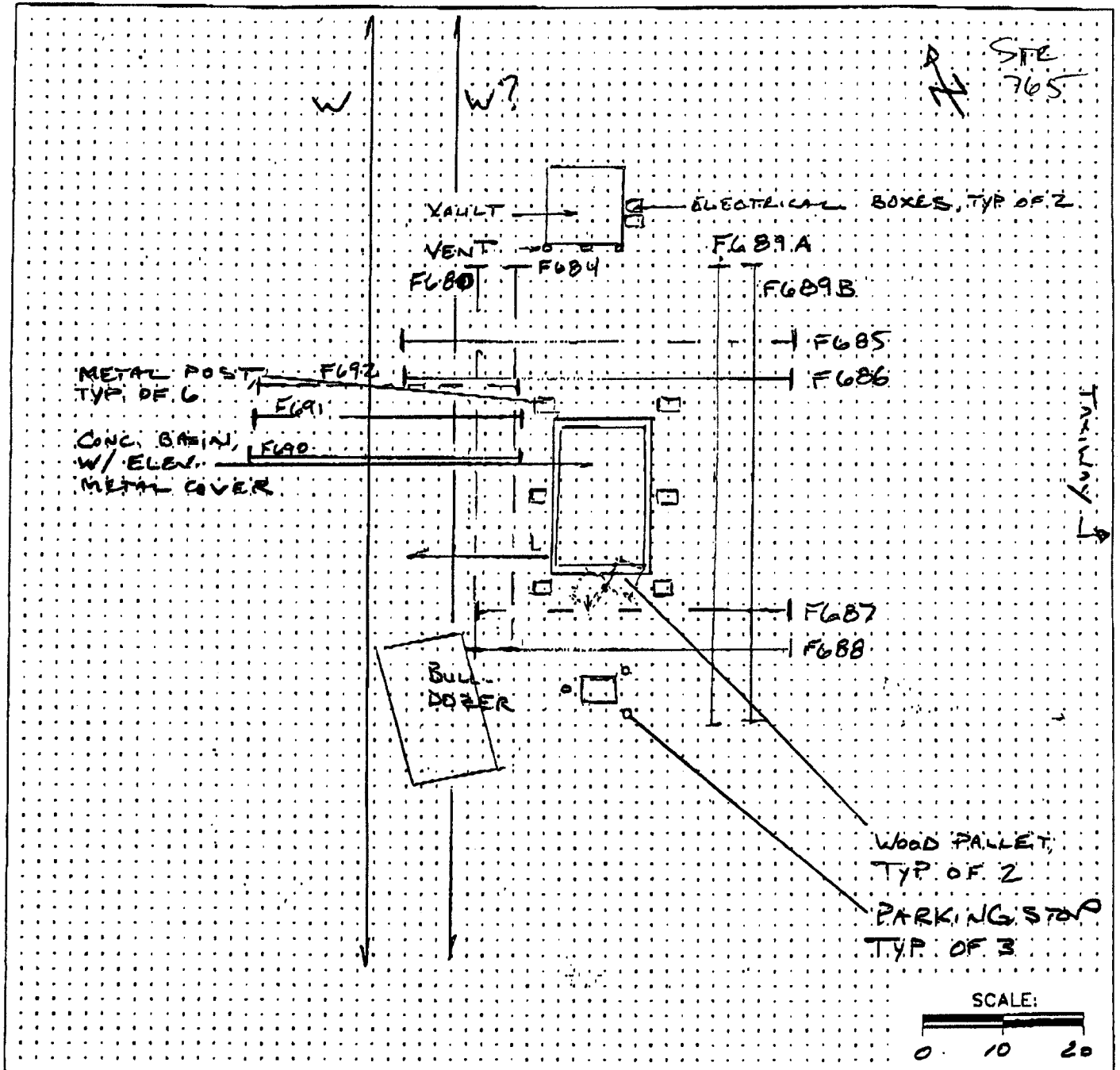
## PROCEDURES

- ☒ 1. Inspect available utility maps and trace all recorded utilities in the vicinity of the proposed ~~drilling~~ location using LT, and if necessary GPR.
- ☐ 2. Review available geophysical data: ☐ Magnetic ☐ EM-31 ☐ EM-61
- ☒ 3. Inspect site and trace all pipes evident from field observations (ie. manhole, vault, valve, cracked asphalt, pipe at surface, etc)
- ☒ 4. Sweep proposed ~~drilling~~ location with LT in 50/60 Hz mode
- ☒ 5. Hold LT transmitter over proposed ~~drilling~~ location and circle at about a 40 foot radius with receiver tracing all utilities encountered.
- ☒ 6. Conduct two perpendicular GPR profiles through proposed <sup>location</sup>~~borehole~~.  
GPR antenna: 500 MHz  
GPR range: 30 sec Estimated depth penetration \*: 3'-4'  
\* utility lines below this depth cannot be detected using GPR
- ☒ 7. Other CLEARED AREA MARKED w/ DASHED ORANGE LINE  
GEOPHYSICAL DATA FOR WATERLINE IS WEAK INTERPRETED  
WATERLINE AND NATURAL GAS FROM BASE DATA BOTH  
DRAWN/PAINTED.

FIELD PERSONNEL: R.A. MERRILL, H. QUINN

SIGNATURE: R.A. Merrill, H. Quinn

# GEOPHYSICAL SURVEY MAP



## LEGEND

— — — GEOPHYSICAL TRAVERSE

## UTILITY:

E = ELECTRICAL, T = TELEPHONE,  
 G = GAS, S = SEWER, SD = STORM DRAIN,  
 W = WATER, P = PRODUCT LINE,  
 V = VENT LINE, L = UNKNOWN LINE

E686(01/17/97 11:24:48) Samp/Scan 512

Scan/Sec 32.0 Bits: 8

Dielectric: 1.00

Position: 0.0ns Range: 30.0ns

Range Gain -12 12 30 54 70

V(IIR LP N=1 F=935)

V(IIR HP N=2 F=58)

H(IIR STK TC=3)

Table #15; Transform #1

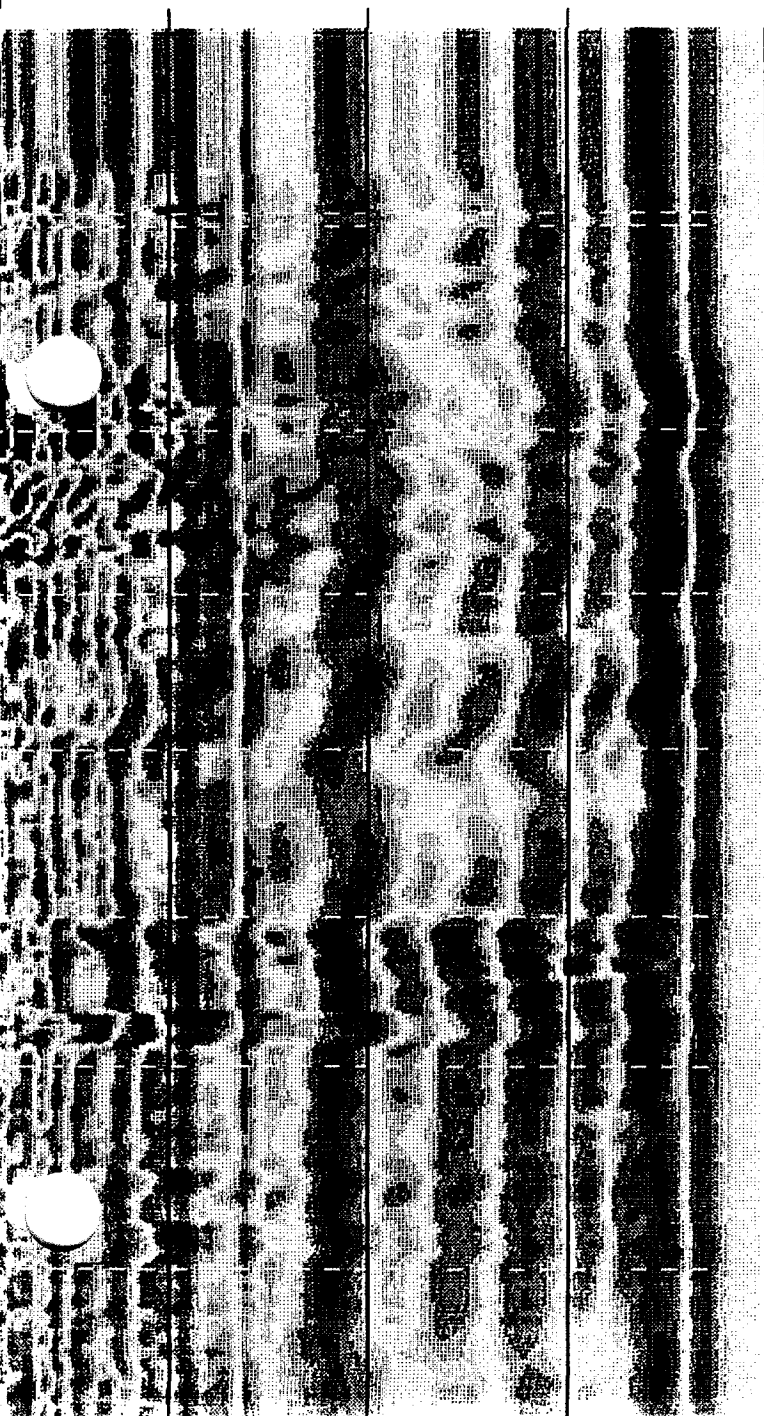


22.50ns

15.00ns

7.50ns

0.00ns



FILE681(01/17/97 11:10:52) Samp/Scan 512

Scan/Sec 32.0 Bits: 8

Dielectric: 1.00

Position: 0.0ns Range: 30.0ns

Range Gain -12 12 30 54 70

V(IIR LP N=1 F=935)

V(IIR HP N=2 F=58)

H(IIR STK TC=3)

Table #15; Transform #1

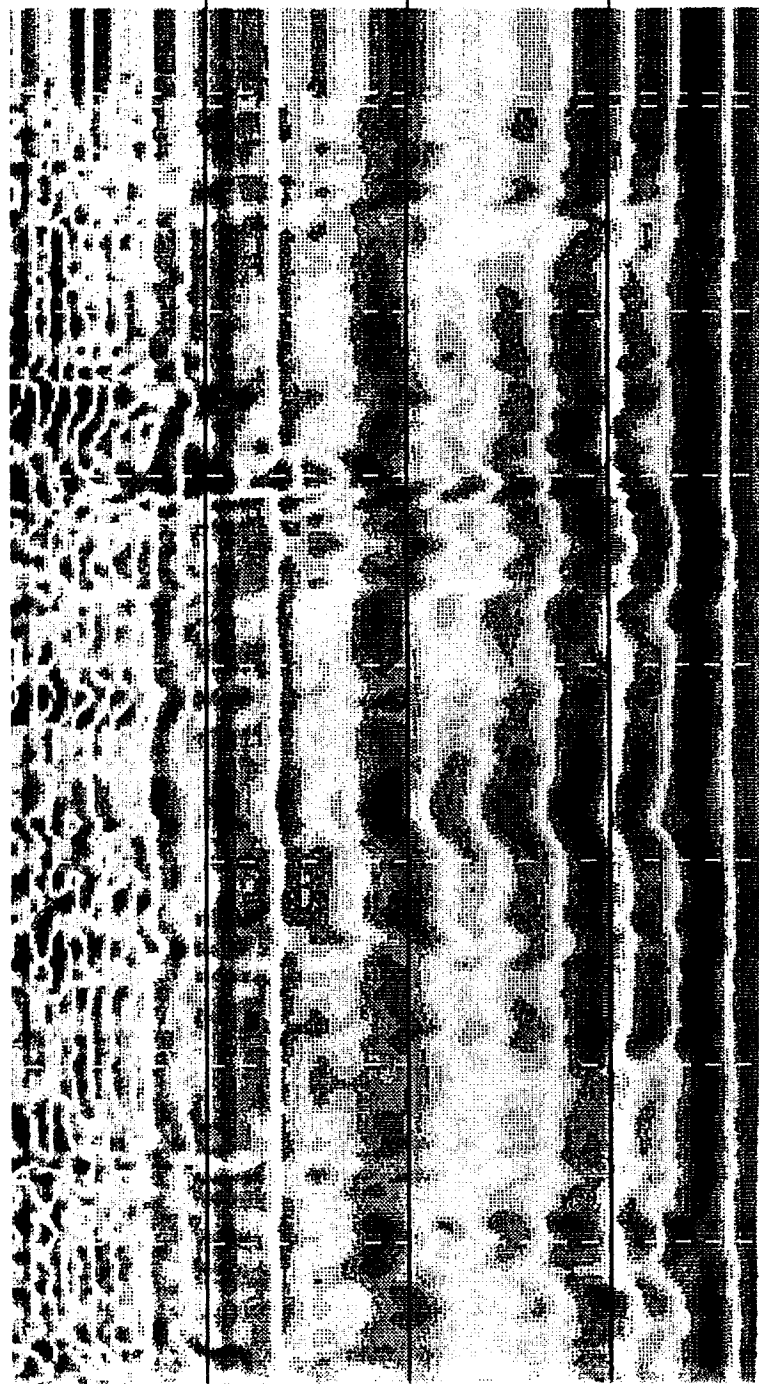


22.50ns

15.00ns

7.50ns

0.00ns



Site 765

W-E

105' N  
of Basin

5' ticks

500

442

Site 765

S-N

10' W of

Basin

5' ticks



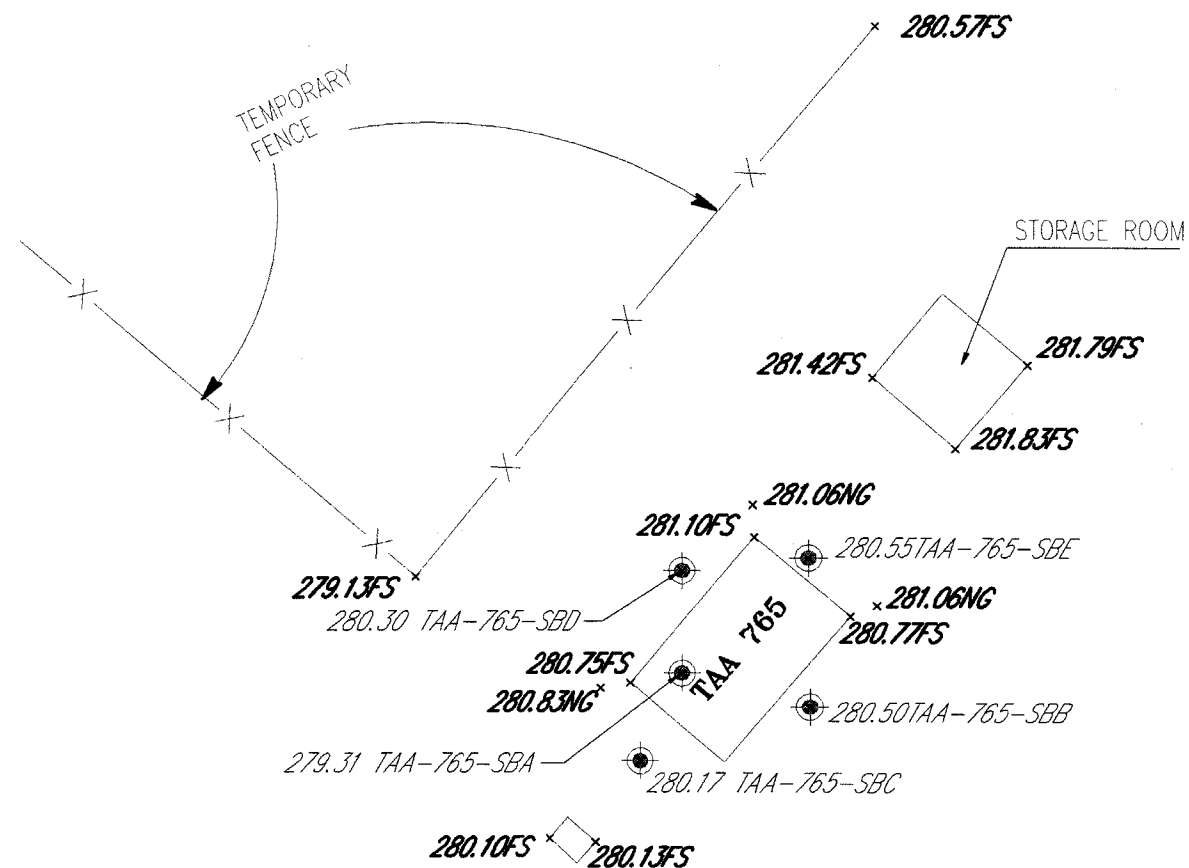
***Appendix G***  
***Land Survey Data***

# MCAS, EL TORO

## TAA-765/D.O. 70

### SAMPLING LOCATIONS COORDINATES LISTING

NORTHING	EASTING	ELEV.	SAMPLE #
2192372.2047	6108008.9027	279.3	TAA-765-SBA
2192368.7041	6108022.0689	280.5	TAA-765-SBB
2192363.0582	6108004.4805	280.2	TAA-765-SBC
2192382.8926	6108008.8829	280.3	TAA-765-SBD
2192384.2259	6108021.8747	280.5	TAA-765-SBE




### Graphic Scale



1 inch = 20 ft.

### LEGEND

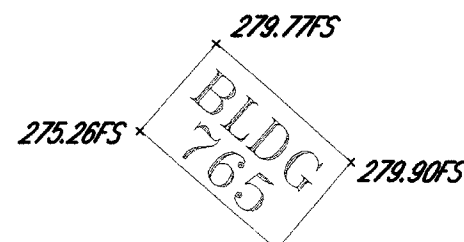
-  SAMPLE LOCATION
- NG NATURAL GROUND
- FS FINISH SURFACE

## CAL VADA

### SURVEYING, INC.

1162 N. Kraemer Place Anaheim, CA. 92806-1922  
 1 800 CALVADA PHONE: (714) 632-2746 FAX: (714) 632-3468  
 WEB SITE <http://www.calvada.com>  
 JOB NO. 97102-51

PREPARED FOR:  
 OHM REMEDIATION SERVICES, CORP.  
 2031 MAIN ST., IRVINE, CA 92714  
 (714) 263-1146



***Appendix H***  
***Laboratory Analytical Results for TAA***  
***Effluent Treated Water***

**COMPLETED**  
OHM Remediation  
Services Corp  
Subsidiary of OHM Corporation  
U.S. Route 224 East • Findlay, Ohio

## CHAIN-OF-CUSTODY RECORD

PROJECT DATA MANAGER'S COPY

213552

FORM 0019 REV. 2-97

OHM's LAB COORDINATOR Dwayne Ishida	LAB COORDINATOR'S PHONE (714) 263-1146	LAB COORDINATOR'S FAX (714) 263-1147	LABORATORY SERVICE ID 9802777	LABORATORY CONTACT RAD WANCY	MAIL REPORT (COMPANY NAME) OHM Remediation
PROJECT NAME TAA RISE Water	PROJECT LOCATION EL TORO MCAS	PROJECT NUMBER 18609	LABORATORY PHONE	LABORATORY FAX	RECIPIENT NAME Mary Schneider
PROJECT CONTACT D. Ishida	PROJECT PHONE NUMBER 263-1146	PROJECT FAX 263-1147	LABORATORY ADDRESS 30212031 Main St.		ADDRESS
PROJECT ADDRESS EL TORO, MCAS	CITY, STATE AND ZIPCODE EL TORO, CA.	CLIENT SNDIV	CITY, STATE, AND ZIPCODE Chino, CA.		CITY, STATE AND ZIPCODE Tehline, CA 92714
PROJECT MANAGER Bill Scallik	PROJECT MANAGER'S PHONE 263-1146	PROJECT MANAGER'S FAX 263-1147	<div style="display: flex; justify-content: space-between;"> <div>             18609              EL TORO              MCAS           </div> <div>             30212031              Main St.              Chino, CA 91710           </div> </div>		

[illegible][illegible]

Distribution: White - Laboratory (To be returned with Analytical Report); Goldenrod - Project File; Yellow - Project Data Manager

**Project Information Section  
For Project Personnel Only  
Do Not Submit to Laboratory**

[illegible]

Comments

Sample Type: G - Grab, C - Composite, F - Field Sample.  
QC - Quality Control Sample

Applied P & Ch Laboratory  
Organic Analysis Results for Method M8015V

Client Name: OHM Remediation Services (Irvine)	Project No: 18609	Collection Date: 05/07/98
Project ID: TAA Rinse Water	Service ID: 982777	Collected by: M.B.
	Lab Sample ID: 98-2777-1	Received Date: 05/07/98
Sample ID: 18609-895	Sample Matrix: Water	Moisture %: -
Sample Type: Field Sample	Prep. Method: 5030	Instrument ID: GC: N
Anal. Method: M8015V	Prep. Date: 05/08/98	Anal. Date: 05/08/98
Batch No: 98G2191	Prep. No: -	Anal. Time: 17:00
Data File Name: 2777.001	Sample Amount: 5 mL	Dilution Factor: 1
Methanol Vol. -		
Test Level: Low	Sparge Size: 5 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	GASOLINE	8006-61-9	mg/L	0.05	<0.05	U
<b>Surrogates</b>				<b>Control Limit, %</b>	<b>Surro. Rec.%</b>	
1	4-BROMO-FLUOROBENZENE (BFB)	460-00-4		71-134	92	
# of out-of-control					0	

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL	E - Exceed calibration range
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)	B - A positive value was found in the method blank
	D - Diluted

72256

Applied P & Ch Laboratory  
Organic Analysis Results for Method M8015E

Client Name: OHM Remediation Services (Irvine)	Project No: 18609	Collection Date: 05/07/98
Project ID: TAA Rinse Water	Service ID: 982777	Collected by: M.B.
	Lab Sample ID: 98-2777-1	Received Date: 05/07/98
Sample ID: 18609-895	Sample Matrix: Water	Moisture %: -
Sample Type: Field Sample	Prep. Method: 3510	Instrument ID: GC: H
Anal. Method: M8015E	Prep. Date: 05/08/98	Anal. Date: 05/09/98
Batch No: 98G2255	Prep. No: 1 of 1	Anal. Time: 04:30
Data File Name: 2777.001	Sample Amount: 1000 mL	Dilution Factor: 1
Extract Vol. 1.0 mL		

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	TPH AS DIESEL	68334-30-5	mg/L	0.5	0.4	J
2	TPH AS MOTOR OIL	TBD-0002	mg/L	0.5	<0.5	U
Surrogates				Control Limit, %	Surro. Rec. %	
1	OCTACOSANE, C <sub>28</sub>	630-02-4		50-149	67	
# of out-of-control					0	

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL	E - Exceed calibration range
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)	B - A positive value was found in the method blank
	D - Diluted

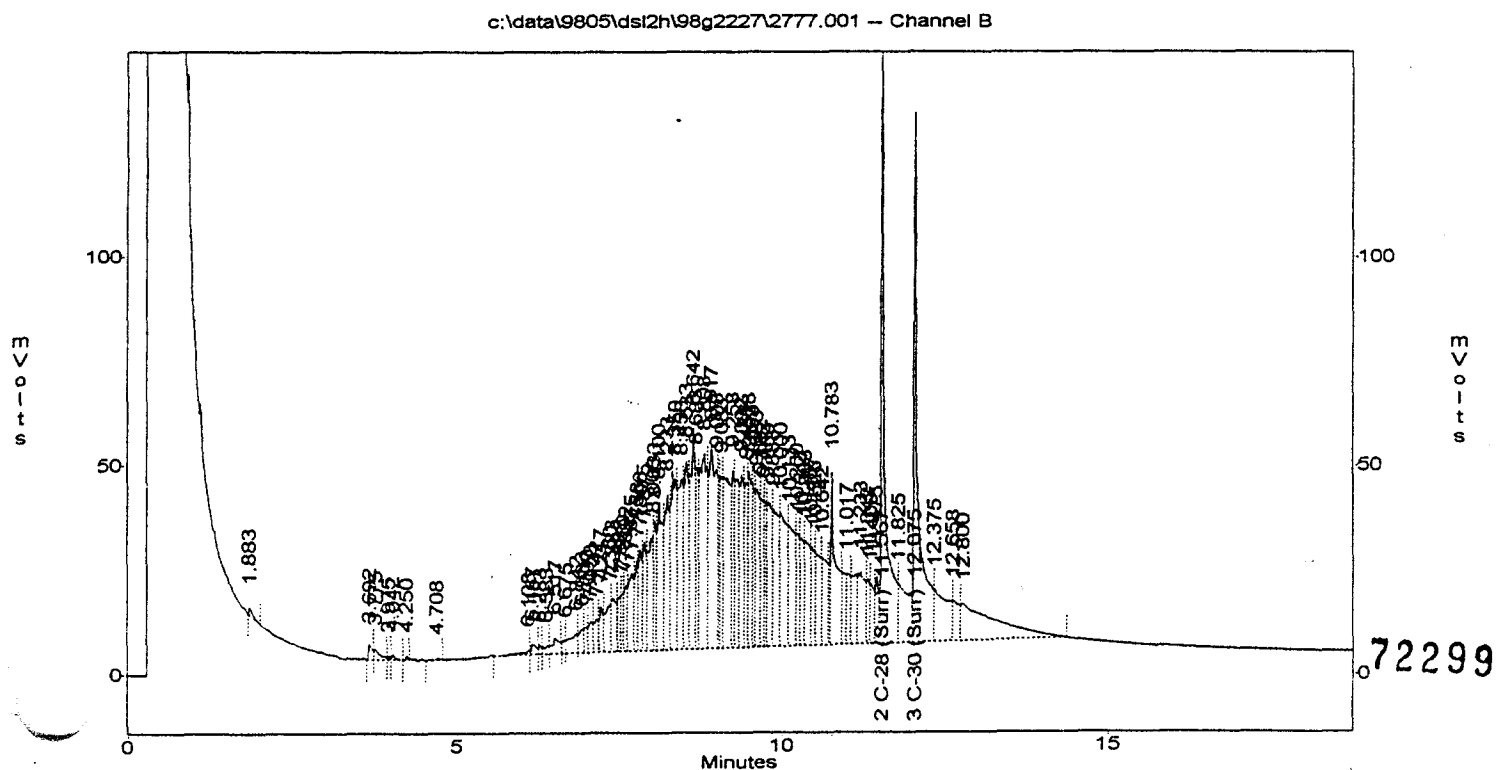
72298

Applied P & Ch Lab  
 Total Extractable Petroleum Hydrocarbon Analysis by GC-FID  
 Instrument ID: GC-H, Column: DB-1 (0.32mm x 15m x 0.25 um), 1ul

File : c:\data\9805\ds12h\98g2227\2777.001  
 Method : c:\ezchrom\methods\ds12-032.h00  
 Sample ID : 2771-1 f=0.001  
 Vial : 19  
 Volume : 1  
 Acquired : May 09, 1998 04:30:09  
 Printed : May 11, 1998 15:29:28  
 User : System

## Channel B Results

Name	Time	Area	Conc (ppm)
2 C-28 (Surr)	11.57	568707	33.572
3 C-30 (Surr)	12.07	559380	34.213
1 DIESEL		6128528	406.124
4 MOTOR OIL		0	0.000



Applied P & Ch Laboratory  
Organic Analysis Results for Method 8260

Client Name: OHM Remediation Services (Irvine)	Project No: 18609	Collection Date: 05/07/98
Project ID: TAA Rinse Water	Service ID: 982777	Collected by: M.B.
	Lab Sample ID: 98-2777-1	Received Date: 05/07/98
Sample ID: 18609-895	Sample Matrix: Water	Moisture %: -
Sample Type: Field Sample	Prep. Method: 5030	Instrument ID: GC/MS: G
Anal. Method: 8260	Prep. Date: 05/10/98	Anal. Date: 05/10/98
Batch No: 98G2263	Prep. No: -	Anal. Time: 02:27
Data File Name: 2777-01	Sample Amount: 25 mL	Dilution Factor: 1
Methanol Vol. -		
Test Level: Low	Sparge Size: 25 mL	Heated Purge: (Y/N) N

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	BENZENE	71-43-2	µg/L	5	< 5	U
2	BROMOBENZENE	108-86-1	µg/L	5	< 5	U
3	BROMOCHLOROMETHANE	74-97-5	µg/L	5	< 5	U
4	BROMODICHLOROMETHANE	75-27-4	µg/L	5	< 5	U
5	BROMOFORM	75-25-2	µg/L	5	< 5	U
6	BROMOMETHANE	74-83-9	µg/L	5	< 5	U
7	N-BUTYLBENZENE	104-51-8	µg/L	5	< 5	U
8	SEC-BUTYLBENZENE	135-98-8	µg/L	5	< 5	U
9	TERT-BUTYLBENZENE	98-06-6	µg/L	5	< 5	U
10	CARBON TETRACHLORIDE	56-23-5	µg/L	5	< 5	U
11	CHLOROBENZENE	108-90-7	µg/L	5	< 5	U
12	DIBROMOCHLOROMETHANE	124-48-1	µg/L	5	< 5	U
13	CHLOROETHANE	75-00-3	µg/L	5	< 5	U
14	CHLOROFORM	67-66-3	µg/L	5	< 5	U
15	CHLOROMETHANE	74-87-3	µg/L	5	< 5	U
16	2-CHLOROTOLUENE	95-49-8	µg/L	5	< 5	U
17	4-CHLOROTOLUENE	106-43-4	µg/L	5	< 5	U
18	1,2-DIBROMO-3-CHLOROPROPANE (DB)	96-12-8	µg/L	5	< 5	U
19	1,2-DIBROMOETHANE (EDB)	106-93-4	µg/L	5	< 5	U
20	DIBROMOMETHANE	74-95-3	µg/L	5	< 5	U
21	1,2-DICHLOROBENZENE	95-50-1	µg/L	5	< 5	U
22	1,3-DICHLOROBENZENE	541-73-1	µg/L	5	< 5	U
23	1,4-DICHLOROBENZENE	106-46-7	µg/L	5	< 5	U
24	DICHLORODIFLUOROMETHANE	75-71-8	µg/L	5	< 5	U
25	1,1-DICHLOROETHANE	75-34-3	µg/L	5	< 5	U
26	1,2-DICHLOROETHANE	107-06-2	µg/L	5	< 5	U
27	1,1-DICHLOROETHENE	75-35-4	µg/L	5	< 5	U
28	CIS-1,2-DICHLOROETHENE	156-59-2	µg/L	5	< 5	U
29	TRANS-1,2-DICHLOROETHENE	156-60-5	µg/L	5	< 5	U
30	1,2-DICHLOROPROPANE	78-87-5	µg/L	5	< 5	U
31	1,3-DICHLOROPROPANE	142-28-9	µg/L	5	< 5	U
32	2,2-DICHLOROPROPANE	594-20-7	µg/L	5	< 5	U
33	1,1-DICHLOROPROPENE	563-58-6	µg/L	5	< 5	U
34	CIS-1,3-DICHLOROPROPENE	10061-01-5	µg/L	5	< 5	U
35	TRANS-1,3-DICHLOROPROPENE	10061-02-6	µg/L	5	< 5	U
36	ETHYLBENZENE	100-41-4	µg/L	5	< 5	U
37	HEXACHLOROBUTADIENE	87-68-3	µg/L	5	< 5	U
38	ISOPROPYLBENZENE (CUMENE)	98-82-8	µg/L	5	< 5	U
39	P-ISOPROPYLTOLUENE	99-87-6	µg/L	5	< 5	U

72112



#	Component Name	CAS No	Unit	RL	Result	Qualifier
40	METHYLENE CHLORIDE	75-09-2	µg/L	5	< 5	U
41	NAPHTHALENE	91-20-3	µg/L	5	< 5	U
42	N-PROPYLBENZENE	103-65-1	µg/L	5	< 5	U
43	STYRENE	100-42-5	µg/L	5	< 5	U
44	1,1,1,2-TETRACHLOROETHANE	630-20-6	µg/L	5	< 5	U
45	1,1,2,2-TETRACHLOROETHANE	79-34-5	µg/L	5	< 5	U
46	TETRACHLOROETHENE	127-18-4	µg/L	5	< 5	U
47	TOLUENE	108-88-3	µg/L	5	< 5	U
48	1,2,3-TRICHLOROBENZENE	87-61-6	µg/L	5	< 5	U
49	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	5	< 5	U
50	1,1,1-TRICHLOROETHANE	71-55-6	µg/L	5	< 5	U
51	1,1,2-TRICHLOROETHANE	79-00-5	µg/L	5	< 5	U
52	TRICHLOROETHENE	79-01-6	µg/L	5	< 5	U
53	TRICHLOROFLUOROMETHANE	75-69-4	µg/L	5	< 5	U
54	1,2,3-TRICHLOROPROPANE	96-18-4	µg/L	5	< 5	U
55	1,2,4-TRIMETHYLBENZENE	95-63-6	µg/L	5	< 5	U
56	1,3,5-TRIMETHYLBENZENE	108-67-8	µg/L	5	< 5	U
57	VINYL CHLORIDE	75-01-4	µg/L	5	< 5	U
58	O-XYLENE	95-47-6	µg/L	5	< 5	U
59	M/P-XYLENE	108-38-3	µg/L	5	< 5	U
60	XYLENES (TOTAL)	1330-20-7	µg/L	5	< 5	U

Surrogates		Control Limit, %		Surro. Rec. %
1	4-BROMO-FLUOROBENZENE (BFB)	460-00-4	86-114	103
2	DIBROMOFLUOROMETHANE	1868-53-7	86-117	101
3	1,2-DICHLOROETHANE-D4	17060-07-0	80-119	101
4	TOLUENE-D8	2037-26-5	88-109	105
# of out-of-control				0

Internal Standard		Control Limit, %		IS Rec. %
1	CHLOROBENZENE-D5	3114-55-4	50-200	87
2	1,4-DICHLOROBENZENE-D4	3855-82-1	50-200	92
3	FLUOROBENZENE	462-06-6	50-200	95
# of out-of-control				0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank

D - Diluted

72113

Applied P & Ch Laboratory  
Organic Analysis Results for Method 8270

Client Name: OHM Remediation Services (Irvine)	Project No: 18609	Collection Date: 05/07/98
Project ID: TAA Rinse Water	Service ID: 982777	Collected by: M.B.
	Lab Sample ID: 98-2777-1	Received Date: 05/07/98
Sample ID: 18609-895	Sample Matrix: Water	Moisture %: -
Sample Type: Field Sample	Prep. Method: 3510	Instrument ID: GC/MS: D
Anal. Method: 8270	Prep. Date: 05/11/98	Anal. Date: 05/11/98
Batch No: 98G2274	Prep. No: 1 of 1	Anal. Time: 22:52
Data File Name: 2777-01	Sample Amount: 1000 mL	Dilution Factor: 1
Extract Vol. 1.0 mL		

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	ACENAPHTHENE	83-32-9	µg/L	10	<10	U
2	ACENAPHTHYLENE	208-96-8	µg/L	10	<10	U
3	ACETOPHENONE	98-86-2	µg/L	10	<10	U
4	4-AMINOBIIPHENYL	92-67-1	µg/L	10	<10	U
5	ANILINE	62-53-3	µg/L	10	<10	U
6	ANTHRACENE	120-12-7	µg/L	10	<10	U
7	BENZO[A]ANTHRACENE	56-55-3	µg/L	10	<10	U
8	BENZIDINE	92-87-5	µg/L	20	<20	U
9	BENZO[A]PYRENE	50-32-8	µg/L	10	<10	U
10	BENZO[B]FLUORANTHENE	205-99-2	µg/L	10	<10	U
11	BENZO[G,H,I]PERYLENE	191-24-2	µg/L	10	<10	U
12	BENZO[K]FLUORANTHENE	207-08-9	µg/L	10	<10	U
13	BENZOIC ACID	65-85-0	µg/L	50	<50	U
14	BENZYL ALCOHOL	100-51-6	µg/L	20	<20	U
15	BIS(2-CHLOROETHOXY)METHANE	111-91-1	µg/L	10	<10	U
16	BIS(2-CHLOROETHYL)ETHER	111-44-4	µg/L	10	<10	U
17	BIS(2-CHLOROISOPROPYL)ETHER	108-60-1	µg/L	10	<10	U
18	BIS(2-ETHYLHEXYL)PHTHALATE	117-81-7	µg/L	10	4	J
19	4-BROMOPHENYL PHENYL ETHER	101-55-3	µg/L	10	<10	U
20	BUTYL BENZYL PHTHALATE	85-68-7	µg/L	10	<10	U
21	3-METHYL-4-CHLOROPHENOL	59-50-7	µg/L	20	<20	U
22	4-CHLOROANILINE	106-47-8	µg/L	20	<20	U
23	1-CHLORONAPHTHALENE	90-13-1	µg/L	10	<10	U
24	2-CHLORONAPHTHALENE	91-58-7	µg/L	10	<10	U
25	2-CHLOROPHENOL	95-57-8	µg/L	10	<10	U
26	4-CHLOROPHENYL PHENYL ETHER	7005-72-3	µg/L	10	<10	U
27	CHRYSENE	218-01-9	µg/L	10	<10	U
28	DI-N-BUTYLPHTHALATE	84-74-2	µg/L	10	<10	U
29	DI-N-OCTYLPHTHALATE	117-84-0	µg/L	10	<10	U
30	DIBENZ[A,H]ANTHRACENE	53-70-3	µg/L	10	<10	U
31	DIBENZ[A,J]ACRIDINE	224-42-0	µg/L	10	<10	U
32	DIBENZOFURAN	132-64-9	µg/L	10	<10	U
33	1,2-DICHLOROBENZENE	95-50-1	µg/L	10	<10	U
34	1,3-DICHLOROBENZENE	541-73-1	µg/L	10	<10	U
35	1,4-DICHLOROBENZENE	106-46-7	µg/L	10	<10	U
36	3,3'-DICHLOROBENZIDINE	91-94-1	µg/L	10	<10	U
37	2,4-DICHLOROPHENOL	120-83-2	µg/L	10	<10	U
38	2,6-DICHLOROPHENOL	87-65-0	µg/L	10	<10	U
39	DIETHYL PHTHALATE	84-66-2	µg/L	10	<10	U
40	DIMETHYL PHTHALATE	131-11-3	µg/L	10	<10	U

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#	Component Name	CAS No	Unit	RL	Result	Qualifier
41	P-DIMETHYLAMINOAZOBENZENE	60-11-7	µg/L	10	< 10	U
42	7,12-DIMETHYLBENZ(A)ANTHRACENE	57-97-6	µg/L	10	< 10	U
43	2,4-DIMETHYLPHENOL	105-67-9	µg/L	10	< 10	U
44	Å-DIMETHYLPHENYLAMINE	122-09-8	µg/L	50	< 50	U
45	2-METHYL-4,6-DINITROPHENOL	534-52-1	µg/L	50	< 50	U
46	2,4-DINITROPHENOL	51-28-5	µg/L	50	< 50	U
47	2,4-DINITROTOLUENE	121-14-2	µg/L	10	< 10	U
48	2,6-DINITROTOLUENE	606-20-2	µg/L	10	< 10	U
49	DIPHENYLAMINE	122-39-4	µg/L	10	< 10	U
50	1,2-DIPHENYLHYDRAZINE	122-66-7	µg/L	10	< 10	U
51	ETHYL METHANESULFONATE	62-50-0	µg/L	10	< 10	U
52	FLUORANTHENE	206-44-0	µg/L	10	< 10	U
53	FLUORENE	86-73-7	µg/L	10	< 10	U
54	HEXACHLOROBENZENE	118-74-1	µg/L	10	< 10	U
55	HEXACHLOROBUTADIENE	87-68-3	µg/L	10	< 10	U
56	HEXACHLOROCYCLOPENTADIENE	77-47-4	µg/L	10	< 10	U
57	HEXACHLOROETHANE	67-72-1	µg/L	10	< 10	U
58	INDENO[1,2,3-CD]PYRENE	193-39-5	µg/L	10	< 10	U
59	ISOPHORONE	78-59-1	µg/L	10	< 10	U
60	METHYL METHANESULFONATE	66-27-3	µg/L	10	< 10	U
61	3-METHYLCHOLANTHRENE	56-49-5	µg/L	10	< 10	U
62	2-METHYLNAPHTHALENE	91-57-6	µg/L	10	< 10	U
63	4-METHYLPHENOL	106-44-5	µg/L	10	< 10	U
64	2-METHYLPHENOL	95-48-7	µg/L	10	< 10	U
65	NAPHTHALENE	91-20-3	µg/L	10	< 10	U
66	1-NAPHTHYLAMINE	134-32-7	µg/L	10	< 10	U
67	2-NAPHTHYLAMINE	91-59-8	µg/L	10	< 10	U
68	2-NITROANILINE	88-74-4	µg/L	50	< 50	U
69	3-NITROANILINE	99-09-2	µg/L	50	< 50	U
70	4-NITROANILINE	100-01-6	µg/L	50	< 50	U
71	NITROBENZENE	98-95-3	µg/L	10	< 10	U
72	2-NITROPHENOL	88-75-5	µg/L	10	< 10	U
73	4-NITROPHENOL	100-02-7	µg/L	50	< 50	U
74	N-NITROSODI-N-PROPYLAMINE	621-64-7	µg/L	10	< 10	U
75	N-NITROSO-DI-N-BUTYLAMINE	924-16-3	µg/L	10	< 10	U
76	N-NITROSODIMETHYLAMINE	62-75-9	µg/L	10	< 10	U
77	N-NITROSODIPHENYLAMINE	86-30-6	µg/L	10	< 10	U
78	N-NITROSOPIPERIDINE	100-75-4	µg/L	10	< 10	U
79	PENTACHLOROBENZENE	608-93-5	µg/L	50	< 50	U
80	PENTACHLOROPHENOL	87-86-5	µg/L	50	< 50	U
81	PHENACETIN	62-44-2	µg/L	10	< 10	U
82	PHENANTHRENE	85-01-8	µg/L	10	< 10	U
83	PHENOL	108-95-2	µg/L	10	< 10	U
84	2-PICOLINE	109-06-8	µg/L	20	< 20	U
85	PRONAMIDE	23950-58-5	µg/L	10	< 10	U
86	PYRENE	129-00-0	µg/L	10	< 10	U
87	1,2,4,5-TETRACHLOROBENZENE	95-94-3	µg/L	10	< 10	U
88	2,3,4,6-TETRACHLOROEPHENOL	58-90-2	µg/L	10	< 10	U
89	1,2,4-TRICHLOROBENZENE	120-82-1	µg/L	10	< 10	U
90	2,4,5-TRICHLOROPHENOL	95-95-4	µg/L	10	< 10	U

72153

#	Component Name	CAS No	Unit	RL	Result	Qualifier
91	2,4,6-TRICHLOROPHENOL	88-06-2	µg/L	10	<10	U
<b>Surrogates</b>				<b>Control Limit, %</b>	<b>Surro. Rec.%</b>	
1	2-FLUOROBIPHENYL	321-60-8		43-115	53	
2	2-FLUOROPHENOL	367-12-4		21- 99	38	
3	NITROBENZENE-D5	4165-60-0		35-113	56	
4	PHENOL-D5	4165-62-2		10- 93	30	
5	TERPHENYL-D14	1718-51-0		33-140	72	
6	2,4,6-TRIBROMOPHENOL	118-79-6		10-122	55	
# of out-of-control					0	
<b>Internal Standard</b>				<b>Control Limit, %</b>	<b>IS Rec.%</b>	
1	ACENAPHTHENE-D10	15067-26-2		50-200	68	
2	CHRYSENE-D12	1719-03-5		50-200	57	
3	1,4-DICHLOROBENZENE-D4	3855-82-1		50-200	69	
4	NAPHTHALENE-D8	1146-65-2		50-200	73	
5	PERYLENE-D12	1520-96-3		50-200	52	
6	PHENANTHRENE-D10	1517-22-2		50-200	58	
# of out-of-control					0	

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL

E - Exceed calibration range

J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)

B - A positive value was found in the method blank

D - Diluted

72154

Applied P & Ch Laboratory  
**Wet Analysis Results for Method 335.2**

Client Name: OHM Remediation Services (Irvine) Project No: 18609 Anal. Method 335.2  
Project ID: TAA Rinse Water Service ID: 982777 Collected by: M.B.

Component Name: CYANIDE

CAS No: 5952-50-0

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
98-2777-1	18609-895	Water	05/07/98	05/07/98	05/11/98	98W2915	mg/L	0.05	<0.05	U
98W2915-MB-01	98W2915-MB-01	Water	05/11/98	05/11/98	05/11/98	98W2915	mg/L	0.05	<0.05	U

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

72392

Applied P & Ch Laboratory  
**Wet Analysis Results for Method 9040**

Client Name: OHM Remediation Services (Irvine) Project No: 18609 Anal. Method 9040  
Project ID: TAA Rinse Water Service ID: 982777 Collected by: M.B.

Component Name: PH  
CAS No: 9999-90

Lab ID	Sample ID	Matrix	Coll. Date	Rcv Date	Anal. Date	Batch	Unit	RL	Result	Q
98-2777-1	18609-895	Water	05/07/98	05/07/98	05/08/98	98W2869	pH unit	0.01	8.15	
98W2869-MB-01	98W2869-MB-01	Water	05/08/98	05/08/98	05/08/98	98W2869	pH unit	0.01	6.56	

Note: Q - Qualifier.

Qualifier: U - Not Detected or less than MDL

B - Less than RL (PQL, EQL or CRDL), but greater than MDL.

72393

Applied P & Ch Laboratory  
**Metal Analysis Results**

Client Name: OHM Remediation Services (Irvine) Project No: 18609 Collection Date: 05/07/98  
 Project ID: TAA Rinse Water Service ID: 982777 Collected by: M.B.  
 Lab Sample ID: 98-2777-1 Received Date: 05/07/98  
 Sample ID: 18609-895 Sample Matrix: Water Moisture %: -  
 Sample Type: Field Sample

Element Name	CAS No	Unit	RL	Result	C	M	Q	Batch	D-Date	A-Date	DF	Method
ANTIMONY	7440-36-0	µg/L	10	<1.9	U	P		98M1447M	05/08/98	05/08/98	1	6010
ARSENIC	7440-38-2	µg/L	5	<1.1	U	P		98M1447M	05/08/98	05/08/98	1	6010
BARIUM	7440-39-3	µg/L	10	35.2		P		98M1447M	05/08/98	05/08/98	1	6010
BERYLLIUM	7440-41-7	µg/L	2	<0.1	U	P		98M1447M	05/08/98	05/08/98	1	6010
CADMIUM	7440-43-9	µg/L	2	0.38	B	P		98M1447M	05/08/98	05/08/98	1	6010
CHROMIUM	7440-47-3	µg/L	5	0.70	B	P		98M1447M	05/08/98	05/08/98	1	6010
COBALT	7440-48-4	µg/L	5	<0.3	U	P		98M1447M	05/08/98	05/08/98	1	6010
COPPER	7440-50-8	µg/L	10	13.8		P		98M1447M	05/08/98	05/08/98	1	6010
LEAD	7439-92-1	µg/L	5	<0.7	U	P		98M1447M	05/08/98	05/08/98	1	6010
MERCURY	7439-97-6	µg/L	0.5	<0.13	U	CV		98M1453D	05/11/98	05/11/98	1	7470
MOLYBDENUM	7439-98-7	µg/L	5	9.3		P		98M1447M	05/08/98	05/08/98	1	6010
NICKEL	7440-02-0	µg/L	5	2.9	B	P		98M1447M	05/08/98	05/08/98	1	6010
SELENIUM	7782-49-2	µg/L	10	<1.5	U	P		98M1447M	05/08/98	05/08/98	1	6010
SILVER	7440-22-4	µg/L	10	<1.1	U	P		98M1447M	05/08/98	05/08/98	1	6010
THALLIUM	7440-28-0	µg/L	10	2.2	B	P		98M1447M	05/08/98	05/08/98	1	6010
VANADIUM	7440-62-2	µg/L	10	<0.91	U	P		98M1447M	05/08/98	05/08/98	1	6010
ZINC	7440-66-6	µg/L	5	30.4		P		98M1447M	05/08/98	05/08/98	1	6010

Not Detected is shown as IDL moisture-corrected if applicable

Note: RL: PQL (EQL) or CRDL D-Date: Digestion Date; A-Date: Analysis Date; DF: Dilution Factor

C Qualifier: U - Not Detected or less than IDL

B - Less than RL (PQL, EQL or CRDL), but greater than IDL.

Q Qualifier: N - Spike recovery out of control

\* - Duplicate analysis out of control

W - Post digestion spike for GFAA out of control

E - Serial dilution difference out of control

M Qualifier: P - ICP

A - FLAA

F - GFAA

CV - Cold Vapor

72345

Applied P & Ch Laboratory  
Organic Analysis Results for Method 8080

Client Name: OHM Remediation Services (Irvine)	Project No: 18609	Collection Date: 05/07/98
Project ID: TAA Rinse Water	Service ID: 982777	Collected by: M.B.
	Lab Sample ID: 98-2777-1	Received Date: 05/07/98
Sample ID: 18609-895	Sample Matrix: Water	Moisture %: -
Sample Type: Field Sample	Prep. Method: 3510	Instrument ID: GC: R
Anal. Method: 8080	Prep. Date: 05/08/98	Anal. Date: 05/09/98
Batch No: 98G2249	Prep. No: 1 of 1	Anal. Time: 06:35
Data File Name: 2777.001	Sample Amount: 1000 mL	Dilution Factor: 1
Extract Vol. 1.0 mL		

#	Component Name	CAS No	Unit	RL	Result	Qualifier
1	ALDRIN	309-00-2	µg/L	0.05	<0.05	U
2	BETA-BHC	319-85-7	µg/L	0.05	<0.05	U
3	ALPHA-BHC	319-84-6	µg/L	0.05	<0.05	U
4	DELTA-BHC	319-86-8	µg/L	0.05	<0.05	U
5	GAMMA-BHC	58-89-9	µg/L	0.05	<0.05	U
6	4,4'-DDD	72-54-8	µg/L	0.1	<0.1	U
7	4,4'-DDE	72-55-9	µg/L	0.1	<0.1	U
8	4,4'-DDT	50-29-3	µg/L	0.1	<0.1	U
9	DIELDRIN	60-57-1	µg/L	0.1	<0.1	U
10	ENDOSULFAN I	959-98-8	µg/L	0.05	<0.05	U
11	ENDOSULFAN II	33213-65-9	µg/L	0.1	<0.1	U
12	ENDOSULFAN SULFATE	1031-07-8	µg/L	0.5	<0.5	U
13	ENDRIN	72-20-8	µg/L	0.1	<0.1	U
14	ENDRIN ALDEHYDE	7421-93-4	µg/L	0.1	<0.1	U
15	ENDRIN KETONE	53494-70-5	µg/L	0.1	<0.1	U
16	HEPTACHLOR	76-44-8	µg/L	0.05	<0.05	U
17	HEPTACHLOR EPOXIDE	1024-57-3	µg/L	0.05	<0.05	U
18	METHOXYCHLOR	72-43-5	µg/L	2	<2	U
19	CHLORDANE	57-74-9	µg/L	2	<2	U
20	TOXAPHENE	8001-35-2	µg/L	5	<5	U
21	AROCLOR-1016	12674-11-2	µg/L	2	<2	U
22	AROCLOR-1221	11104-28-2	µg/L	5	<5	U
23	AROCLOR-1232	11141-16-5	µg/L	2	<2	U
24	AROCLOR-1242	53469-21-9	µg/L	2	<2	U
25	AROCLOR-1248	12672-29-6	µg/L	2	<2	U
26	AROCLOR-1254	11097-69-1	µg/L	1	<1	U
27	AROCLOR-1260	11096-82-5	µg/L	1	<1	U

Surrogates		Control Limit, %	Surro. Rec.%
1	DECACHLOROBIPHENYL (DCB) 2051-24-3	30-145	78
2	2,4,5,6-TETRACHLORO-M-XYLENE 877-09-8	34-144	76
# of out-of-control			0

Internal Standard		Control Limit, %	IS Rec.%
1	DIBUTYLCHLORENDATE (DBC) 1770-80-5	50-200	79
# of out-of-control			0

Not Detected is shown as PQL, with dilution and moisture corrected if applicable.

Qualifier: U - Not Detected or less than MDL  
J - Less than RL (PQL, EQL or CRDL), but greater than MDL, or an estimated result (e.g. for TIC)  
E - Exceed calibration range  
B - A positive value was found in the method blank  
D - Diluted

72195



***Appendix I***  
***Laboratory Analytical Results***

APPENDIX I  
LABORATORY ANALYTICAL RESULTS

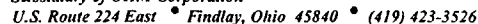
CLOSURE REPORT  
TEMPORARY ACCUMULATION AREA 765

THE ABOVE APPENDIX WAS RECEIVED AS-IS.

QUESTIONS MAY BE DIRECTED TO:

**DIANE C. SILVA**  
**RECORDS MANAGEMENT SPECIALIST**  
**SOUTHWEST DIVISION**  
**NAVAL FACILITIES ENGINEERING COMMAND**  
**1220 PACIFIC HIGHWAY**  
**SAN DIEGO, CA 92132**

**TELEPHONE: (619) 532-3676**



DC 70

FROM DUTCH NARRATIVES

212089

FORM 0019 REV. 2-97

Distribution: White - Laboratory (To be returned with Analytical Report); Goldenrod - Project File; Yellow - Project Data Manager

Sample Type: G - Grab, C - Composite, F - Field San  
QC - Quality Control Sample

000016

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 10

SAMPLE DESCRIPTION, AQUEOUS SAMPLE							DATE SAMPLED	
9711012*1	18609-753						11.03.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG	
Mod 8015 - Gas								
TPH (Gasoline Range)	8015M		11.10.97	1	mg/L	0.1	U	
Surrogates **								
a,a,a-Trifluorotoluene Rep.	8015M		11.10.97	1	Percent	95		

000015

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 9

## SAMPLE DESCRIPTION, AQUEOUS SAMPLE

DATE SAMPLED

9711012\*1 18609-753 11.03.97

PARAMETER METHOD PREPED ANALYZED DIL UNITS RESULT FLG

JP-5

TPH (Diesel Range) 8015M 11.04.97 11.04.97 1 mg/L 0.5 U

JP-5 8015M 11.04.97 11.04.97 1 mg/L 0.5 U

Surrogates \*\*

Naphthalene Reported 8015M 11.04.97 11.04.97 1 Percent 89

o-Terphenyl Reported 8015M 11.04.97 11.04.97 1 Percent 98

000017

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 11

## SAMPLE DESCRIPTION, AQUEOUS SAMPLE

DATE SAMPLED

9711012\*1 18609-753 11.03.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
Volatiles							
1,1,1-Trichloroethane	8260A		11.11.97	1	ug/L	5	U
1,1,2,2-Tetrachloroethane	8260A		11.11.97	1	ug/L	5	U
1,1,2-Trichloroethane	8260A		11.11.97	1	ug/L	5	U
1,1-Dichloroethane	8260A		11.11.97	1	ug/L	5	U
1,1-Dichloroethene	8260A		11.11.97	1	ug/L	5	U
1,2-Dichloroethane	8260A		11.11.97	1	ug/L	5	U
1,2-Dichloropropane	8260A		11.11.97	1	ug/L	5	U
2-Chloroethylvinylether	8260A		11.11.97	1	ug/L	50	U
2-Hexanone	8260A		11.11.97	1	ug/L	50	U
Acetone	8260A		11.11.97	1	ug/L	50	U
Bromodichloromethane	8260A		11.11.97	1	ug/L	0.77	J
Bromomethane	8260A		11.11.97	1	ug/L	5	U
Benzene	8260A		11.11.97	1	ug/L	5	U
Bromoform	8260A		11.11.97	1	ug/L	5	U
Chlorobenzene	8260A		11.11.97	1	ug/L	5	U
Carbon Tetrachloride	8260A		11.11.97	1	ug/L	5	U
Chloroethane	8260A		11.11.97	1	ug/L	5	U
Chloroform	8260A		11.11.97	1	ug/L	0.74	J
Chloromethane	8260A		11.11.97	1	ug/L	5	U
Carbon Disulfide	8260A		11.11.97	1	ug/L	5	U
Dibromochloromethane	8260A		11.11.97	1	ug/L	0.59	J
Ethylbenzene	8260A		11.11.97	1	ug/L	5	U
Methyl ethyl ketone	8260A		11.11.97	1	ug/L	50	U
Methyl isobutyl ketone	8260A		11.11.97	1	ug/L	50	U
Methyl-tert-butylether	8260A		11.11.97	1	ug/L	10	U
Methylene chloride	8260A		11.11.97	1	ug/L	5	U

000018

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 12

SAMPLE DESCRIPTION, AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9711012*1	18609-753						11.03.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							-----
Volatiles							
Styrene	8260A		11.11.97	1	ug/L	5	U
Trichloroethene	8260A		11.11.97	1	ug/L	5	U
Toluene	8260A		11.11.97	1	ug/L	5	U
Tetrachloroethene	8260A		11.11.97	1	ug/L	5	U
Vinyl acetate	8260A		11.11.97	1	ug/L	50	U
Vinyl chloride	8260A		11.11.97	1	ug/L	5	U
Total Xylene Isomers	8260A		11.11.97	1	ug/L	15	U
cis-1,2-Dichloroethene	8260A		11.11.97	1	ug/L	5	U
cis-1,3-Dichloropropene	8260A		11.11.97	1	ug/L	5	U
trans-1,2-Dichloroethene	8260A		11.11.97	1	ug/L	5	U
trans-1,3-Dichloropropene	8260A		11.11.97	1	ug/L	5	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		11.11.97	1	Percent	106	
4-Bromofluorobenzene Rep.	8260A		11.11.97	1	Percent	102	
Toluene-d8 Reported	8260A		11.11.97	1	Percent	105	
Dibromofluoromethane Rep.	8260A		11.11.97	1	Percent	81	
-----							-----

000009

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 3

## SAMPLE DESCRIPTION, AQUEOUS SAMPLE

DATE SAMPLED

9711012\*1 18609-753 11.03.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
B/N,A Ext.Pri.Poll.							
1,2,4-Trichlorobenzene	8270B	11.05.97	11.11.97	1	ug/L	10	U
1,2-Dichlorobenzene	8270B	11.05.97	11.11.97	1	ug/L	10	U
1,3-Dichlorobenzene	8270B	11.05.97	11.11.97	1	ug/L	10	U
1,4-Dichlorobenzene	8270B	11.05.97	11.11.97	1	ug/L	10	U
2,4,5-Trichlorophenol	8270B	11.05.97	11.11.97	1	ug/L	10	U
2,4,6-Trichlorophenol	8270B	11.05.97	11.11.97	1	ug/L	10	U
2,4-Dichlorophenol	8270B	11.05.97	11.11.97	1	ug/L	10	U
2,4-Dimethylphenol	8270B	11.05.97	11.11.97	1	ug/L	10	U
2,4-Dinitrophenol	8270B	11.05.97	11.11.97	1	ug/L	25	U
2,4-Dinitrotoluene	8270B	11.05.97	11.11.97	1	ug/L	10	U
2,6-Dinitrotoluene	8270B	11.05.97	11.11.97	1	ug/L	10	U
2-Chloronaphthalene	8270B	11.05.97	11.11.97	1	ug/L	10	U
2-Chlorophenol	8270B	11.05.97	11.11.97	1	ug/L	10	U
2-Methyl-4,6-dinitrophenol	8270B	11.05.97	11.11.97	1	ug/L	25	U
2-Methylnaphthalene	8270B	11.05.97	11.11.97	1	ug/L	10	U
2-Methylphenol (o-Cresol)	8270B	11.05.97	11.11.97	1	ug/L	10	U
2-Nitroaniline	8270B	11.05.97	11.11.97	1	ug/L	10	U
2-Nitrophenol	8270B	11.05.97	11.11.97	1	ug/L	10	U
3,3'-Dichlorobenzidine	8270B	11.05.97	11.11.97	1	ug/L	10	U
3-Nitroaniline	8270B	11.05.97	11.11.97	1	ug/L	10	U
4-Bromophenylphenylether	8270B	11.05.97	11.11.97	1	ug/L	10	U
4-Chloro-3-methylphenol	8270B	11.05.97	11.11.97	1	ug/L	10	U
4-Chloroaniline	8270B	11.05.97	11.11.97	1	ug/L	10	U
4-Chlorophenylphenylether	8270B	11.05.97	11.11.97	1	ug/L	10	U
4-Methylphenol (p-Cresol)	8270B	11.05.97	11.11.97	1	ug/L	10	U
4-Nitroaniline	8270B	11.05.97	11.11.97	1	ug/L	10	U



000010

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 4

SAMPLE DESCRIPTION, AQUEOUS SAMPLE						DATE SAMPLED	
9711012*1		18609-753				11.03.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
B/N,A Ext.Pri.Poll.							
4-Nitrophenol	8270B	11.05.97	11.11.97	1	ug/L	25	U
Acenaphthene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Acenaphthylene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Anthracene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Benzo(a)anthracene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Benzo(a)pyrene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Benzo(b)fluoranthene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Benzo(g,h,i)perylene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Benzo(k)fluoranthene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Butylbenzylphthalate	8270B	11.05.97	11.11.97	1	ug/L	10	U
Chrysene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Di-n-octylphthalate	8270B	11.05.97	11.11.97	1	ug/L	10	U
Dibenzo(a,h)anthracene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Dibenzofuran	8270B	11.05.97	11.11.97	1	ug/L	10	U
Dibutylphthalate	8270B	11.05.97	11.11.97	1	ug/L	10	U
Diethylphthalate	8270B	11.05.97	11.11.97	1	ug/L	10	U
Dimethylphthalate	8270B	11.05.97	11.11.97	1	ug/L	10	U
Fluoranthene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Fluorene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Hexachlorobenzene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Hexachlorobutadiene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Hexachlorocyclopentadiene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Hexachloroethane	8270B	11.05.97	11.11.97	1	ug/L	10	U
Indeno(1,2,3-c,d)pyrene	8270B	11.05.97	11.11.97	1	ug/L	10	U
N-Nitrosodiphenylamine	8270B	11.05.97	11.11.97	1	ug/L	10	U
N-Nitrosodi-n-propylamine	8270B	11.05.97	11.11.97	1	ug/L	10	U

000011

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 5

SAMPLE DESCRIPTION, AQUEOUS SAMPLE							DATE SAMPLED
9711012*1 18609-753							11.03.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
B/N,A Ext.Pri.Poll.							
Nitrobenzene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Naphthalene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Phenanthrene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Phenol	8270B	11.05.97	11.11.97	1	ug/L	10	U
Pentachlorophenol	8270B	11.05.97	11.11.97	1	ug/L	20	U
Pyrene	8270B	11.05.97	11.11.97	1	ug/L	10	U
Bis(2-chloroethoxy)methane	8270B	11.05.97	11.11.97	1	ug/L	10	U
Bis(2-chloroethyl)ether	8270B	11.05.97	11.11.97	1	ug/L	10	U
Bis(2-chloroisopropyl)ether	8270B	11.05.97	11.11.97	1	ug/L	10	U
Bis(2-ethylhexyl)phthalate	8270B	11.05.97	11.11.97	1	ug/L	7.10	J
Surrogates **							
2-Fluorobiphenyl Reported	8270B	11.05.97	11.11.97	1	Percent	75	
2-Fluorophenol Reported	8270B	11.05.97	11.11.97	1	Percent	46	
2,4,6-Tribromophenol Rep.	8270B	11.05.97	11.11.97	1	Percent	89	
Nitrobenzene-d5 Reported	8270B	11.05.97	11.11.97	1	Percent	66	
Phenol-d5 Reported	8270B	11.05.97	11.11.97	1	Percent	34	
Terphenyl-d14 Reported	8270B	11.05.97	11.11.97	1	Percent	78	

000012

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 6

SAMPLE DESCRIPTION, AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9711012*1	18609-753						11.03.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLGS
-----							-----
Pesticides							
Aldrin	8081	11.06.97	11.09.97	1	ug/L	0.03	U
p,p'-DDD	8081	11.06.97	11.09.97	1	ug/L	0.03	U
p,p'-DDE	8081	11.06.97	11.09.97	1	ug/L	0.03	U
p,p'-DDT	8081	11.06.97	11.09.97	1	ug/L	0.05	U
γ-hexachlorocyclohexene (lindrin)	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endosulfan I	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endosulfan II	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endosulfan sulfate	8081	11.06.97	11.09.97	1	ug/L	0.05	U
Endrin	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endrin aldehyde	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endrin Ketone	8081	11.06.97	11.09.97	1	ug/L	0.05	U
Heptachlor epoxide	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Heptachlor	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Methoxychlor	8081	11.06.97	11.09.97	1	ug/L	0.05	U
Toxaphene	8081	11.06.97	11.09.97	1	ug/L	5	U
BHC, alpha isomer	8081	11.06.97	11.09.97	1	ug/L	0.03	U
alpha-Chlordane	8081	11.06.97	11.09.97	1	ug/L	0.03	U
BHC, beta isomer	8081	11.06.97	11.09.97	1	ug/L	0.03	U
BHC, delta isomer	8081	11.06.97	11.09.97	1	ug/L	0.03	U
BHC, gamma isomer (Lindane)	8081	11.06.97	11.09.97	1	ug/L	0.03	U
gamma-Chlordane	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Surrogates **							
Decachlorobiphenyl Reported	8081	11.06.97	11.09.97	1	Percent	96	
Tetrachloro-meta-xylene Rpt	8081	11.06.97	11.09.97	1	Percent	81	
-----							-----

000013

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 7

SAMPLE DESCRIPTION, AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9711012*1	18609-753						11.03.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLGS
-----							
Pesticides Confirmation							
Aldrin	8081	11.06.97	11.09.97	1	ug/L	0.03	U
p,p'-DDD	8081	11.06.97	11.09.97	1	ug/L	0.03	U
p,p'-DDE	8081	11.06.97	11.09.97	1	ug/L	0.03	U
p,p'-DDT	8081	11.06.97	11.09.97	1	ug/L	0.05	U
Dieldrin	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endosulfan I	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endosulfan II	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endosulfan sulfate	8081	11.06.97	11.09.97	1	ug/L	0.05	U
Endrin	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endrin aldehyde	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Endrin Ketone	8081	11.06.97	11.09.97	1	ug/L	0.05	U
Heptachlor epoxide	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Heptachlor	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Methoxychlor	8081	11.06.97	11.09.97	1	ug/L	0.05	U
Toxaphene	8081	11.06.97	11.09.97	1	ug/L	5	U
BHC, alpha isomer	8081	11.06.97	11.09.97	1	ug/L	0.03	U
alpha-Chlordane	8081	11.06.97	11.09.97	1	ug/L	0.03	U
BHC, beta isomer	8081	11.06.97	11.09.97	1	ug/L	0.03	U
BHC, delta isomer	8081	11.06.97	11.09.97	1	ug/L	0.03	U
BHC, gamma isomer (Lindane)	8081	11.06.97	11.09.97	1	ug/L	0.03	U
gamma-Chlordane	8081	11.06.97	11.09.97	1	ug/L	0.03	U
Surrogates **							
Decachlorobiphenyl Reported	8081	11.06.97	11.09.97	1	Percent	96	
Tetrachloro-meta-xylene Rpt	8081	11.06.97	11.09.97	1	Percent	81	
-----							

000014

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

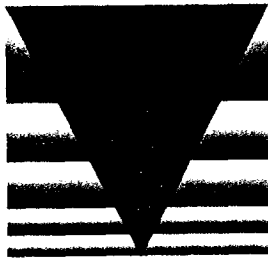
Page 8

## SAMPLE DESCRIPTION, AQUEOUS SAMPLE

DATE SAMPLED

9711012\*1 18609-753 11.03.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
Polychlorinated Biphenyls							
Aroclor 1016	8081	11.06.97	11.09.97	1	ug/L	1	U
Aroclor 1221	8081	11.06.97	11.09.97	1	ug/L	1	U
Aroclor 1232	8081	11.06.97	11.09.97	1	ug/L	1	U
Aroclor 1242	8081	11.06.97	11.09.97	1	ug/L	1	U
Aroclor 1248	8081	11.06.97	11.09.97	1	ug/L	1	U
Aroclor 1254	8081	11.06.97	11.09.97	1	ug/L	1	U
Aroclor 1260	8081	11.06.97	11.09.97	1	ug/L	1	U
Surrogates **							
Decachlorobiphenyl Reported	8081	11.06.97	11.09.97	1	Percent	96	
Tetrachloro-meta-xylene Rpt	8081	11.06.97	11.09.97	1	Percent	81	



Our Quality Control Is Your Quality Assurance

## ANALYTICAL REPORT

000007

SAMPLE NO: 9711012\*1

Received: 11.03.97

Mailed:

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

### REPORT OF ANALYTICAL RESULTS

Page 1

SAMPLE DESCRIPTION, AQUEOUS SAMPLE							DATE SAMPLED
9711012*1 18609-753							11.03.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
Total Cyanide	9010A	11.05.97	11.05.97	1	mg/L	0.02	U
pH	9040		11.04.97	1	Units	8.5	
Aluminum	6010A	11.05.97	11.10.97	1	ug/L	99	J
Antimony	6010A	11.05.97	11.10.97	1	ug/L	500	U
Arsenic	7060A	11.05.97	11.06.97	1	ug/L	2.5	J
Barium	6010A	11.05.97	11.10.97	1	ug/L	87	J
Beryllium	6010A	11.05.97	11.10.97	1	ug/L	10	U
Cadmium	6010A	11.05.97	11.10.97	1	ug/L	2.2	J
Calcium	6010A	11.05.97	11.10.97	1	ug/L	64000	
Chromium	6010A	11.05.97	11.10.97	1	ug/L	6.1	J
Cobalt	6010A	11.05.97	11.10.97	1	ug/L	50	U
Copper	6010A	11.05.97	11.10.97	1	ug/L	11	J
Iron	6010A	11.05.97	11.10.97	1	ug/L	530	
Lead	7421	11.05.97	11.06.97	1	ug/L	5	U
Magnesium	6010A	11.05.97	11.10.97	1	ug/L	25000	
Manganese	6010A	11.05.97	11.10.97	1	ug/L	17	J
Mercury	7470A	11.10.97	11.11.97	1	ug/L	0.2	U
Molybdenum	6010A	11.05.97	11.10.97	1	ug/L	100	U
Nickel	6010A	11.05.97	11.10.97	1	ug/L	150	U
Potassium	6010A	11.05.97	11.10.97	1	ug/L	4800	J
Selenium	7740	11.05.97	11.06.97	1	ug/L	5	U
Silver	6010A	11.05.97	11.10.97	1	ug/L	50	U
Sodium	6010A	11.05.97	11.10.97	1	ug/L	92000	
Thallium	6010A	11.05.97	11.10.97	1	ug/L	26	J
Vanadium	6010A	11.05.97	11.10.97	1	ug/L	100	U
Zinc	6010A	11.05.97	11.10.97	1	ug/L	23	

000008

SAMPLE NO: 9711012\*1

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

REPORT OF ANALYTICAL RESULTS

Page 2

SAMPLE DESCRIPTION, AQUEOUS SAMPLE						DATE SAMPLED	
-----						-----	
9711012*1	18609-753					11.03.97	
-----						-----	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							
Digestion	3010	11.05.97	11.05.97	1	Date	11/05/97	
Furnace Digestion	3020	11.05.97	11.05.97	1	Date	11/05/97	
-----							

# ANALYTICAL REPORT

000019

SAMPLE NO: 9711012\*2

Received: 11.03.97

Mailed:

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 1

### SAMPLE DESCRIPTION, AQUEOUS SAMPLE

DATE SAMPLED

9711012\*2 18609-754 11.03.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

Mod 8015 - Gas

TPH (Gasoline Range)	8015M		11.10.97	1	mg/L	0.1	U
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Surrogates \*\*

a,a,a-Trifluorotoluene Rep.	8015M		11.10.97	1	Percent	103	
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SAMPLE NO: 9711012\*2

Received: 11.03.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 2

SAMPLE DESCRIPTION, AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9711012*2	18609-754						11.03.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							-----
Volatiles							
1,1,1-Trichloroethane	8260A		11.11.97	1	ug/L	5	U
1,1,2,2-Tetrachloroethane	8260A		11.11.97	1	ug/L	5	U
1,1,2-Trichloroethane	8260A		11.11.97	1	ug/L	5	U
1,1-Dichloroethane	8260A		11.11.97	1	ug/L	5	U
1,1-Dichloroethene	8260A		11.11.97	1	ug/L	5	U
1,2-Dichloroethane	8260A		11.11.97	1	ug/L	5	U
1,2-Dichloropropane	8260A		11.11.97	1	ug/L	5	U
2-Chloroethylvinylether	8260A		11.11.97	1	ug/L	50	U
2-Hexanone	8260A		11.11.97	1	ug/L	50	U
Acetone	8260A		11.11.97	1	ug/L	50	U
Bromodichloromethane	8260A		11.11.97	1	ug/L	5	U
Bromomethane	8260A		11.11.97	1	ug/L	5	U
Benzene	8260A		11.11.97	1	ug/L	5	U
Bromoform	8260A		11.11.97	1	ug/L	5	U
Chlorobenzene	8260A		11.11.97	1	ug/L	5	U
Carbon Tetrachloride	8260A		11.11.97	1	ug/L	5	U
Chloroethane	8260A		11.11.97	1	ug/L	5	U
Chloroform	8260A		11.11.97	1	ug/L	5	U
Chloromethane	8260A		11.11.97	1	ug/L	5	U
Carbon Disulfide	8260A		11.11.97	1	ug/L	5	U
Dibromochloromethane	8260A		11.11.97	1	ug/L	5	U
Ethylbenzene	8260A		11.11.97	1	ug/L	5	U
Methyl ethyl ketone	8260A		11.11.97	1	ug/L	50	U
Methyl isobutyl ketone	8260A		11.11.97	1	ug/L	50	U
Methyl-tert-butylether	8260A		11.11.97	1	ug/L	10	U
Methylene chloride	8260A		11.11.97	1	ug/L	5	U
-----							-----

000021

SAMPLE NO: 9711012\*2

Received: 11.03.97

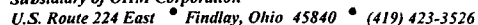
Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609/EL.TORO

## REPORT OF ANALYTICAL RESULTS

Page 3

SAMPLE DESCRIPTION, AQUEOUS SAMPLE							DATE SAMPLED	
9711012*2 18609-754							11.03.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG	
Volatiles								
Styrene	8260A		11.11.97	1	ug/L	5	U	
Trichloroethene	8260A		11.11.97	1	ug/L	5	U	
Toluene	8260A		11.11.97	1	ug/L	5	U	
Tetrachloroethene	8260A		11.11.97	1	ug/L	5	U	
Vinyl acetate	8260A		11.11.97	1	ug/L	50	U	
Vinyl chloride	8260A		11.11.97	1	ug/L	5	U	
Total Xylene Isomers	8260A		11.11.97	1	ug/L	20	U	
cis-1,2-Dichloroethene	8260A		11.11.97	1	ug/L	5	U	
cis-1,3-Dichloropropene	8260A		11.11.97	1	ug/L	5	U	
trans-1,2-Dichloroethene	8260A		11.11.97	1	ug/L	5	U	
trans-1,3-Dichloropropene	8260A		11.11.97	1	ug/L	5	U	
Surrogates **								
1,2-Dichloroethane-d4 Rep.	8260A		11.11.97	1	Percent	108		
4-Bromofluorobenzene Rep.	8260A		11.11.97	1	Percent	103		
Toluene-d8 Reported	8260A		11.11.97	1	Percent	105		
Dibromofluoromethane Rep.	8260A		11.11.97	1	Percent	82		



FORM 0019 REV. 2-97

Comments
Sample Type: G - Grab. C - Composite. F - Field Sample QC - Quality Control Sample

000019

SAMPLE NO: 9710430\*1

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 12

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
9710430*1	18609-709						10.21.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 13.0% moisture)							
Mod 8015 - Gas							
TPH (Gasoline Range)	8015M		10.24.97	1	mg/kg	11	U
Surrogates **							
a,a,a-Trifluorotoluene Rep.	8015M		10.24.97	1	Percent	115	

000018

SAMPLE NO: 9710430\*1

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 11

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*1 18609-709 10.21.97

PARAMETER METHOD PREPED ANALYZED DIL UNITS RESULT FLG

(Following results reported on the basis of 13.0% moisture)

JP-5

TPH (Diesel Range)	8015M	10.24.97	10.28.97	20	mg/kg	530	
JP-5	8015M	10.24.97	10.28.97	20	mg/kg	230	U
Surrogates **							
Naphthalene Reported	8015M	10.24.97	10.28.97	20	Percent	0	NC
o-Terphenyl Reported	8015M	10.24.97	10.28.97	20	Percent	0	NC

000020

SAMPLE NO: 9710430\*1

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 13

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
9710430*1 18609-709							10.21.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 13.0% moisture)							
Volatiles							
1,1,1-Trichloroethane	8260A		10.27.97	1	ug/kg	5.7	U
1,1,2,2-Tetrachloroethane	8260A		10.27.97	1	ug/kg	5.7	U
1,1,2-Trichloroethane	8260A		10.27.97	1	ug/kg	5.7	U
1,1-Dichloroethane	8260A		10.27.97	1	ug/kg	5.7	U
1,1-Dichloroethene	8260A		10.27.97	1	ug/kg	5.7	U
1,2-Dichloroethane	8260A		10.27.97	1	ug/kg	5.7	U
1,2-Dichloropropane	8260A		10.27.97	1	ug/kg	5.7	U
2-Chloroethylvinylether	8260A		10.27.97	1	ug/kg	57	U
2-Hexanone	8260A		10.27.97	1	ug/kg	57	U
Acetone	8260A		10.27.97	1	ug/kg	57	U
Bromodichloromethane	8260A		10.27.97	1	ug/kg	5.7	U
Bromomethane	8260A		10.27.97	1	ug/kg	5.7	U
Benzene	8260A		10.27.97	1	ug/kg	5.7	U
Bromoform	8260A		10.27.97	1	ug/kg	5.7	U
Chlorobenzene	8260A		10.27.97	1	ug/kg	5.7	U
Carbon Tetrachloride	8260A		10.27.97	1	ug/kg	5.7	U
Chloroethane	8260A		10.27.97	1	ug/kg	5.7	U
Chloroform	8260A		10.27.97	1	ug/kg	5.7	U
Chloromethane	8260A		10.27.97	1	ug/kg	5.7	U
Dibromochloromethane	8260A		10.27.97	1	ug/kg	5.7	U
Ethylbenzene	8260A		10.27.97	1	ug/kg	5.7	U
Methyl ethyl ketone	8260A		10.27.97	1	ug/kg	57	U
Methyl isobutyl ketone	8260A		10.27.97	1	ug/kg	57	U
Methyl-tert-butylether	8260A		10.27.97	1	ug/kg	11	U

000021

SAMPLE NO: 9710430\*1

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P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 14

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*1 18609-709 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 13.0% moisture)

## Volatiles

Methylene chloride	8260A		10.27.97	1	ug/kg	5.7	U
Styrene	8260A		10.27.97	1	ug/kg	5.7	U
Trichloroethene	8260A		10.27.97	1	ug/kg	5.7	U
Toluene	8260A		10.27.97	1	ug/kg	5.7	U
Tetrachloroethene	8260A		10.27.97	1	ug/kg	5.7	U
Vinyl acetate	8260A		10.27.97	1	ug/kg	11	U
Vinyl chloride	8260A		10.27.97	1	ug/kg	5.7	U
Total Xylene Isomers	8260A		10.27.97	1	ug/kg	17	U
cis-1,2-Dichloroethene	8260A		10.27.97	1	ug/kg	5.7	U
cis-1,3-Dichloropropene	8260A		10.27.97	1	ug/kg	5.7	U
trans-1,2-Dichloroethene	8260A		10.27.97	1	ug/kg	5.7	U
trans-1,3-Dichloropropene	8260A		10.27.97	1	ug/kg	5.7	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		10.27.97	1	Percent	79	
4-Bromofluorobenzene Rep.	8260A		10.27.97	1	Percent	100	
Toluene-d8 Reported	8260A		10.27.97	1	Percent	98	
Dibromofluoromethane Rep.	8260A		10.27.97	1	Percent	91	

000010

SAMPLE NO: 9710430\*1

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
9710430*1	18609-709					10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 13.0% moisture)							
Compounds by SIM							
Hexachlorobenzene	8270.S	10.23.97	11.17.97	10	ug/kg	760	U
Indeno(1,2,3-c,d)pyrene	8270.S	10.23.97	11.17.97	10	ug/kg	380	U
Pentachlorophenol	8270.S	10.23.97	11.17.97	10	ug/kg	2000	U
Surrogates **							
2,4,6-Tribromophenol Rep.	8270.S	10.23.97	11.17.97	10	Percent	62	
Terphenyl-d14 Reported	8270.S	10.23.97	11.17.97	10	Percent	52	



000011

SAMPLE NO: 9710430\*1

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 4

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*1 18609-709 10.21.97

PARAMETER METHOD PREPED ANALYZED DIL UNITS RESULT FLG

(Following results reported on the basis of 13.0% moisture)

## Compounds by SIM

Benzo(a)pyrene	8270.S	10.23.97	10.28.97	5	ug/kg	200	U
Dibenzo(a,h)anthracene	8270.S	10.23.97	10.28.97	5	ug/kg	200	U
Nitrosodi-n-propylamine	8270.S	10.23.97	10.28.97	5	ug/kg	200	U
is(2-chloroethyl)ether	8270.S	10.23.97	10.28.97	5	ug/kg	200	U
Surrogates **							
2-Fluorobiphenyl Reported	8270.S	10.23.97	10.28.97	5	Percent	55	
Terphenyl-d14 Reported	8270.S	10.23.97	10.28.97	5	Percent	71	

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SAMPLE NO: 9710430\*1

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 5

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
9710430*1 18609-709						10.21.97	
PARAMETER	METHOD	PREP	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 13.0% moisture)							
Semi-volatiles							
1,2,4-Trichlorobenzene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
1,2-Dichlorobenzene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
1,3-Dichlorobenzene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
1,4-Dichlorobenzene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2,4,5-Trichlorophenol	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2,4,6-Trichlorophenol	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2,4-Dichlorophenol	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2,4-Dimethylphenol	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2,4-Dinitrophenol	8270B	10.23.97	10.29.97	10	ug/kg	9500	U
2,4-Dinitrotoluene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2,6-Dinitrotoluene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2-Chloronaphthalene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2-Chlorophenol	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2-Methyl-4,6-dinitrophenol	8270B	10.23.97	10.29.97	10	ug/kg	9500	U
2-Methylnaphthalene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2-Methylphenol (o-Cresol)	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2-Nitroaniline	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
2-Nitrophenol	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
3,3'-Dichlorobenzidine	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
3-Nitroaniline	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
4-Bromophenylphenylether	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
4-Chloro-3-methylphenol	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
4-Chloroaniline	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
4-Chlorophenylphenylether	8270B	10.23.97	10.29.97	10	ug/kg	3800	U

000013

SAMPLE NO: 9710430\*1

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 6

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
9710430*1 18609-709						10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 13.0% moisture)							
Semi-volatiles							
4-Methylphenol (p-Cresol)	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
4-Nitroaniline	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
-Nitrophenol	8270B	10.23.97	10.29.97	10	ug/kg	9500	U
Acenaphthene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Acenaphthylene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Anthracene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Benzo(a)anthracene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Benzo(b)fluoranthene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Benzo(g,h,i)perylene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Benzo(k)fluoranthene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Butylbenzylphthalate	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Chrysene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Di-n-octylphthalate	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Dibenzofuran	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Dibutylphthalate	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Diethylphthalate	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Dimethylphthalate	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Fluoranthene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Fluorene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Hexachlorobutadiene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Hexachlorocyclopentadiene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Hexachloroethane	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
N-Nitrosodiphenylamine	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Nitrobenzene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U

000014

SAMPLE NO: 9710430\*1

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 7

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*1 18609-709 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 13.0% moisture)

## Semi-volatiles

Naphthalene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Phenanthrene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Phenol	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Pyrene	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Bis(2-chloroethoxy)methane	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Bis(2-chloroisopropyl)ether	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Bis(2-ethylhexyl)phthalate	8270B	10.23.97	10.29.97	10	ug/kg	3800	U
Surrogates **							
2-Fluorobiphenyl Reported	8270B	10.23.97	10.29.97	10	Percent	0	NC
2-Fluorophenol Reported	8270B	10.23.97	10.29.97	10	Percent	0	NC
2,4,6-Tribromophenol Rep.	8270B	10.23.97	10.29.97	10	Percent	0	NC
Nitrobenzene-d5 Reported	8270B	10.23.97	10.29.97	10	Percent	0	NC
Phenol-d5 Reported	8270B	10.23.97	10.29.97	10	Percent	0	NC
Terphenyl-d14 Reported	8270B	10.23.97	10.29.97	10	Percent	0	NC

SAMPLE NO: 9710430\*1

Received: 10.22.97

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 10

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*1	18609-709	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 13.0% moisture)

## Pesticides Confirmation

Aldrin	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
o,p'-DDD	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
p,p'-DDE	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
p,p'-DDT	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Dieldrin	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Endosulfan I	8081	10.24.97	10.29.97	2	ug/kg	1.6	U
Endosulfan II	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Endosulfan sulfate	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Endrin	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Endrin aldehyde	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Endrin Ketone	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Heptachlor epoxide	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Heptachlor	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Methoxychlor	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Toxaphene	8081	10.24.97	10.29.97	2	ug/kg	390	U
BHC, alpha isomer	8081	10.24.97	10.29.97	2	ug/kg	1.6	U
alpha-Chlordane	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
BHC, beta isomer	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
BHC, delta isomer	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
BHC, gamma isomer (Lindane)	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
gamma-Chlordane	8081	10.24.97	10.29.97	2	ug/kg	4.6	U
Surrogates **							

000016B

SAMPLE NO: 9710430\*1

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## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 11

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*1	18609-709	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 13.0% moisture)

## Pesticides Confirmation

Decachlorobiphenyl Reported	8081	10.24.97	10.29.97	2	Percent	107
Tetrachloro-meta-xylene Rpt	8081	10.24.97	10.29.97	2	Percent	94

000017

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Req#: D0#0070  
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## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 10

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*1 18609-709 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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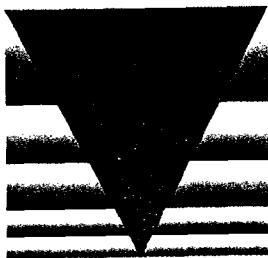
(Following results reported on the basis of 13.0% moisture)

## Polychlorinated Biphenyls

Aroclor 1016	8081	10.24.97	10.29.97	2	ug/kg	76	U
Aroclor 1221	8081	10.24.97	10.29.97	2	ug/kg	76	U
Aroclor 1232	8081	10.24.97	10.29.97	2	ug/kg	76	U
Aroclor 1242	8081	10.24.97	10.29.97	2	ug/kg	76	U
Aroclor 1248	8081	10.24.97	10.29.97	2	ug/kg	76	U
Aroclor 1254	8081	10.24.97	10.29.97	2	ug/kg	76	U
Aroclor 1260	8081	10.24.97	10.29.97	2	ug/kg	76	U

Surrogates \*\*

Decachlorobiphenyl Reported	8081	10.24.97	10.29.97	2	Percent	104	
Tetrachloro-meta-xylene Rpt	8081	10.24.97	10.29.97	2	Percent	92	



Our Quality Control Is Your Quality Assurance

# ANALYTICAL REPORT

000008

SAMPLE NO: 9710430\*1

Received: 10.22.97

Mailed:

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

### SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*1 18609-709 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 13.0% moisture)

Total Cyanide	9010A	10.24.97	10.24.97	1	mg/kg	0.57	U
pH	9045		10.24.97	1	Units	7.9	
-Moisture/TNFR	D2216		10.24.97	1	Percent	13	
Aluminum	6010A	10.27.97	10.28.97	1	mg/kg	4700	
Antimony	6010A	10.27.97	10.28.97	1	mg/kg	5.7	U
Arsenic	7060A	10.27.97	10.28.97	1	mg/kg	1.00	
Barium	6010A	10.27.97	10.28.97	1	mg/kg	74	
Beryllium	6010A	10.27.97	10.28.97	1	mg/kg	0.25	
Cadmium	6010A	10.27.97	10.28.97	1	mg/kg	0.57	U
Calcium	6010A	10.27.97	10.28.97	1	mg/kg	3400	
Chromium	6010A	10.27.97	10.28.97	1	mg/kg	6.4	
Cobalt	6010A	10.27.97	10.28.97	1	mg/kg	3.6	
Copper	6010A	10.27.97	10.28.97	1	mg/kg	3.0	
Iron	6010A	10.27.97	10.28.97	1	mg/kg	7800	
Lead	7421	10.27.97	10.28.97	1	mg/kg	1.3	
Magnesium	6010A	10.27.97	10.28.97	1	mg/kg	2900	
Manganese	6010A	10.27.97	10.28.97	1	mg/kg	110	
Mercury	7471A	10.24.97	10.27.97	1	mg/kg	0.092	U
Molybdenum	6010A	10.27.97	10.28.97	1	mg/kg	2.3	U
Nickel	6010A	10.27.97	10.28.97	1	mg/kg	4.5	
Potassium	6010A	10.27.97	10.28.97	1	mg/kg	2100	
Selenium	7740	10.27.97	10.28.97	1	mg/kg	0.57	U
Silver	6010A	10.27.97	10.28.97	1	mg/kg	1.1	U
Sodium	6010A	10.27.97	10.28.97	1	mg/kg	110	



000009

SAMPLE NO: 9710430\*1

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED	
9710430*1		18609-709					10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG	
(Following results reported on the basis of 13.0% moisture)								
Thallium	6010A	10.27.97	10.28.97	1	mg/kg	5.7	U	
Sodium	6010A	10.27.97	10.28.97	1	mg/kg	17		
Cadmium	6010A	10.27.97	10.28.97	1	mg/kg	54		
Digestion	3050	10.27.97	10.27.97	1	Date	10/27/97		
Furnace Digestion	3050	10.27.97	10.27.97	1	Date	10/27/97		

SAMPLE NO: 9710430\*11

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 6

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*11	18609-710	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 16.0% moisture)

## Volatiles

1,1,1-Trichloroethane	8260A		10.28.97	1	ug/kg	6	U
1,1,2,2-Tetrachloroethane	8260A		10.28.97	1	ug/kg	6	U
1,1,2-Trichloroethane	8260A		10.28.97	1	ug/kg	6	U
1,1-Dichloroethane	8260A		10.28.97	1	ug/kg	6	U
1,1-Dichloroethene	8260A		10.28.97	1	ug/kg	6	U
1,2-Dichloroethane	8260A		10.28.97	1	ug/kg	6	U
1,2-Dichloropropane	8260A		10.28.97	1	ug/kg	6	U
2-Chloroethylvinylether	8260A		10.28.97	1	ug/kg	60	U
2-Hexanone	8260A		10.28.97	1	ug/kg	60	U
Acetone	8260A		10.28.97	1	ug/kg	60	U
Bromodichloromethane	8260A		10.28.97	1	ug/kg	6	U
Bromomethane	8260A		10.28.97	1	ug/kg	6	U
Benzene	8260A		10.28.97	1	ug/kg	6	U
Bromoform	8260A		10.28.97	1	ug/kg	6	U
Chlorobenzene	8260A		10.28.97	1	ug/kg	6	U
Carbon Tetrachloride	8260A		10.28.97	1	ug/kg	6	U
Chloroethane	8260A		10.28.97	1	ug/kg	6	U
Chloroform	8260A		10.28.97	1	ug/kg	6	U
Chloromethane	8260A		10.28.97	1	ug/kg	6	U
Carbon Disulfide	8260A		10.28.97	1	ug/kg	6	U
Dibromochloromethane	8260A		10.28.97	1	ug/kg	6	U
Ethylbenzene	8260A		10.28.97	1	ug/kg	6	U
Methyl ethyl ketone	8260A		10.28.97	1	ug/kg	60	U
Methyl isobutyl ketone	8260A		10.28.97	1	ug/kg	60	U

SAMPLE NO: 9710430\*11

Received: 10.22.97

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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 7

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*11	18609-710	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 16.0% moisture)

## Volatiles

Methyl-tert-butylether	8260A		10.28.97	1	ug/kg	12	U
Methylene chloride	8260A		10.28.97	1	ug/kg	6	U
tyrene	8260A		10.28.97	1	ug/kg	6	U
richloroethene	8260A		10.28.97	1	ug/kg	6	U
Toluene	8260A		10.28.97	1	ug/kg	6	U
Tetrachloroethene	8260A		10.28.97	1	ug/kg	6	U
Vinyl acetate	8260A		10.28.97	1	ug/kg	12	U
Vinyl chloride	8260A		10.28.97	1	ug/kg	6	U
Total Xylene Isomers	8260A		10.28.97	1	ug/kg	18	U
cis-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	6	U
cis-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	6	U
trans-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	6	U
trans-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	6	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		10.28.97	1	Percent	85	
4-Bromofluorobenzene Rep.	8260A		10.28.97	1	Percent	101	
Toluene-d8 Reported	8260A		10.28.97	1	Percent	97	
Dibromofluoromethane Rep.	8260A		10.28.97	1	Percent	92	

000177

SAMPLE NO: 9710430\*11

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
9710430*11 18609-710							10.21.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 16.0% moisture)							
Compounds by SIM							
Benzo(a)pyrene	8270.S	11.03.97	11.06.97	1	ug/kg	39	U
Dibenzo(a,h)anthracene	8270.S	11.03.97	11.06.97	1	ug/kg	39	U
N-Nitrosodi-n-propylamine	8270.S	11.03.97	11.06.97	1	ug/kg	39	U
Bis(2-chloroethyl)ether	8270.S	11.03.97	11.06.97	1	ug/kg	39	U
Surrogates **							
2-Fluorobiphenyl Reported	8270.S	11.03.97	11.06.97	1	Percent	51	
Terphenyl-d14 Reported	8270.S	11.03.97	11.06.97	1	Percent	58	

000178

SAMPLE NO: 9710430\*11

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9710430*11	18609-710						10.21.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							
(Following results reported on the basis of 16.0% moisture)							
Semi-volatiles							
1,2,4-Trichlorobenzene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
1,2-Dichlorobenzene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
1,3-Dichlorobenzene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
1,4-Dichlorobenzene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2,4,5-Trichlorophenol	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2,4,6-Trichlorophenol	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2,4-Dichlorophenol	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2,4-Dimethylphenol	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2,4-Dinitrophenol	8270B	11.03.97	11.05.97	1	ug/kg	990	U
2,4-Dinitrotoluene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2,6-Dinitrotoluene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2-Chloronaphthalene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2-Chlorophenol	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2-Methyl-4,6-dinitrophenol	8270B	11.03.97	11.05.97	1	ug/kg	990	U
2-Methylnaphthalene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2-Methylphenol (o-Cresol)	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2-Nitroaniline	8270B	11.03.97	11.05.97	1	ug/kg	390	U
2-Nitrophenol	8270B	11.03.97	11.05.97	1	ug/kg	390	U
3,3'-Dichlorobenzidine	8270B	11.03.97	11.05.97	1	ug/kg	390	U
3-Nitroaniline	8270B	11.03.97	11.05.97	1	ug/kg	390	U
4-Bromophenylphenylether	8270B	11.03.97	11.05.97	1	ug/kg	390	U
4-Chloro-3-methylphenol	8270B	11.03.97	11.05.97	1	ug/kg	390	U
4-Chloroaniline	8270B	11.03.97	11.05.97	1	ug/kg	390	U
4-Chlorophenylphenylether	8270B	11.03.97	11.05.97	1	ug/kg	390	U
-----							

SAMPLE NO: 9710430\*11

Received: 10.22.97

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2031 Main Street  
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P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 4

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*11	18609-710	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 16.0% moisture)

## Semi-volatiles

4-Methylphenol (p-Cresol)	8270B	11.03.97	11.05.97	1	ug/kg	390	U
4-Nitroaniline	8270B	11.03.97	11.05.97	1	ug/kg	390	U
4-Nitrophenol	8270B	11.03.97	11.05.97	1	ug/kg	990	U
Acenaphthene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Acenaphthylene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Anthracene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Benzo(a)anthracene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Benzo(b)fluoranthene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Benzo(g,h,i)perylene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Benzo(k)fluoranthene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Butylbenzylphthalate	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Chrysene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Di-n-octylphthalate	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Dibenzofuran	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Dibutylphthalate	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Diethylphthalate	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Dimethylphthalate	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Fluoranthene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Fluorene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Hexachlorobenzene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Hexachlorobutadiene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Hexachlorocyclopentadiene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Hexachloroethane	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Indeno(1,2,3-c,d)pyrene	8270B	11.03.97	11.05.97	1	ug/kg	390	U

000180

SAMPLE NO: 9710430\*11

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 5

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
9710430*11 18609-710							10.21.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 16.0% moisture)							
Semi-volatiles							
N-Nitrosodiphenylamine	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Nitrobenzene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
naphthalene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Phenanthrene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Phenol	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Pentachlorophenol	8270B	11.03.97	11.05.97	1	ug/kg	790	U
Pyrene	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Bis(2-chloroethoxy)methane	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Bis(2-chloroisopropyl)ether	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Bis(2-ethylhexyl)phthalate	8270B	11.03.97	11.05.97	1	ug/kg	390	U
Surrogates **							
2-Fluorobiphenyl Reported	8270B	11.03.97	11.05.97	1	Percent	97	
2-Fluorophenol Reported	8270B	11.03.97	11.05.97	1	Percent	80	
2,4,6-Tribromophenol Rep.	8270B	11.03.97	11.05.97	1	Percent	97	
Nitrobenzene-d5 Reported	8270B	11.03.97	11.05.97	1	Percent	80	
Phenol-d5 Reported	8270B	11.03.97	11.05.97	1	Percent	90	
Terphenyl-d14 Reported	8270B	11.03.97	11.05.97	1	Percent	87	

# ANALYTICAL REPORT

000176

SAMPLE NO: 9710430\*11

Received: 10.22.97

Mailed:

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

### SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*11 18609-710 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 16.0% moisture)

-Moisture/TNFR	D2216		10.30.97	1	Percent	16	
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000032

SAMPLE NO: 9710430\*2

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 11

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*2 18609-711 10.21.97

PARAMETER METHOD PREPED ANALYZED DIL UNITS RESULT FLG

(Following results reported on the basis of 9.9% moisture)

Mod 8015 - Gas

TPH (Gasoline Range)	8015M	10.24.97	1	mg/kg	11	U
Surrogates **						
1, a, a-Trifluorotoluene Rep.	8015M	10.24.97	1	Percent	107	

000031

SAMPLE NO: 9710430\*2

Received: 10.22.97

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 10

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*2 18609-711 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 9.9% moisture)

JP-5

TPH (Diesel Range)	8015M	10.24.97	10.28.97	1	mg/kg	11	U
JP-5	8015M	10.24.97	10.28.97	1	mg/kg	11	U
Surrogates **							
Naphthalene Reported	8015M	10.24.97	10.28.97	1	Percent	92	
o-Terphenyl Reported	8015M	10.24.97	10.28.97	1	Percent	104	

000033

SAMPLE NO: 9710430\*2

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 12

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9710430*2	18609-711						10.21.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							-----
(Following results reported on the basis of 9.9% moisture)							
Volatiles							
1,1,1-Trichloroethane	8260A		10.28.97	1	ug/kg	5.5	U
1,1,2,2-Tetrachloroethane	8260A		10.28.97	1	ug/kg	5.5	U
1,1,2-Trichloroethane	8260A		10.28.97	1	ug/kg	5.5	U
1,1-Dichloroethane	8260A		10.28.97	1	ug/kg	5.5	U
1,1-Dichloroethene	8260A		10.28.97	1	ug/kg	5.5	U
1,2-Dichloroethane	8260A		10.28.97	1	ug/kg	5.5	U
1,2-Dichloropropane	8260A		10.28.97	1	ug/kg	5.5	U
2-Chloroethylvinylether	8260A		10.28.97	1	ug/kg	55	U
2-Hexanone	8260A		10.28.97	1	ug/kg	55	U
Acetone	8260A		10.28.97	1	ug/kg	55	U
Bromodichloromethane	8260A		10.28.97	1	ug/kg	5.5	U
Bromomethane	8260A		10.28.97	1	ug/kg	5.5	U
Benzene	8260A		10.28.97	1	ug/kg	5.5	U
Bromoform	8260A		10.28.97	1	ug/kg	5.5	U
Chlorobenzene	8260A		10.28.97	1	ug/kg	5.5	U
Carbon Tetrachloride	8260A		10.28.97	1	ug/kg	5.5	U
Chloroethane	8260A		10.28.97	1	ug/kg	5.5	U
Chloroform	8260A		10.28.97	1	ug/kg	5.5	U
Chloromethane	8260A		10.28.97	1	ug/kg	5.5	U
Dibromochloromethane	8260A		10.28.97	1	ug/kg	5.5	U
Ethylbenzene	8260A		10.28.97	1	ug/kg	5.5	U
Methyl ethyl ketone	8260A		10.28.97	1	ug/kg	55	U
Methyl isobutyl ketone	8260A		10.28.97	1	ug/kg	55	U
Methyl-tert-butylether	8260A		10.28.97	1	ug/kg	11	U
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000034

SAMPLE NO: 9710430\*2

Received: 10.22.97

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P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 13

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
9710430*2	18609-711						10.21.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 9.9% moisture)							
Volatiles							
Methylene chloride	8260A		10.28.97	1	ug/kg	5.5	U
Styrene	8260A		10.28.97	1	ug/kg	5.5	U
Trichloroethene	8260A		10.28.97	1	ug/kg	5.5	U
Toluene	8260A		10.28.97	1	ug/kg	5.5	U
Tetrachloroethene	8260A		10.28.97	1	ug/kg	5.5	U
Vinyl acetate	8260A		10.28.97	1	ug/kg	11	U
Vinyl chloride	8260A		10.28.97	1	ug/kg	5.5	U
Total Xylene Isomers	8260A		10.28.97	1	ug/kg	17	U
cis-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	5.5	U
cis-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	5.5	U
trans-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	5.5	U
trans-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	5.5	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		10.28.97	1	Percent	81	
4-Bromofluorobenzene Rep.	8260A		10.28.97	1	Percent	100	
Toluene-d8 Reported	8260A		10.28.97	1	Percent	96	
Dibromofluoromethane Rep.	8260A		10.28.97	1	Percent	81	

000024

SAMPLE NO: 9710430\*2

Received: 10.22.97

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2031 Main Street  
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P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED	
-----							-----	
9710430*2	18609-711						10.21.97	
-----							-----	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG	
-----								
(Following results reported on the basis of 9.9% moisture)								
Compounds by SIM								
Benzo(a)pyrene	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
Dibenzo(a,h)anthracene	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
-Nitrosodi-n-propylamine	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
Bis(2-chloroethyl)ether	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
Surrogates **								
2-Fluorobiphenyl Reported	8270.S	10.23.97	10.28.97	1	Percent	59		
Terphenyl-d14 Reported	8270.S	10.23.97	10.28.97	1	Percent	62		

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SAMPLE NO: 9710430\*2

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 4

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9710430*2	18609-711						10.21.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							-----
(Following results reported on the basis of 9.9% moisture)							
Semi-volatiles							
1,2,4-Trichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,2-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,3-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,4-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4,5-Trichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4,6-Trichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dimethylphenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dinitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	920	U
2,4-Dinitrotoluene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,6-Dinitrotoluene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Chloronaphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Chlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Methyl-4,6-dinitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	920	U
2-Methylnaphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Methylphenol (o-Cresol)	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Nitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
3,3'-Dichlorobenzidine	8270B	10.23.97	10.28.97	1	ug/kg	370	U
3-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Bromophenylphenylether	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chloro-3-methylphenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chloroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chlorophenylphenylether	8270B	10.23.97	10.28.97	1	ug/kg	370	U
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SAMPLE NO: 9710430\*2

Received: 10.22.97

Ms. Mary Schneider  
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2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 5

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

-----  
9710430\*2      18609-711      10.21.97  
-----

-----  
PARAMETER      METHOD    PREPED    ANALYZED    DIL      UNITS      RESULT    FLG  
-----

(Following results reported on the basis of 9.9% moisture)

## Semi-volatiles

4-Methylphenol (p-Cresol)	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Nitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	920	U
Acenaphthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Acenaphthylene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Anthracene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(a)anthracene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(b)fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(g,h,i)perylene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(k)fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Butylbenzylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Chrysene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Di-n-octylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dibenzofuran	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dibutylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Diethylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dimethylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Fluorene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorobutadiene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorocyclopentadiene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachloroethane	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Indeno(1,2,3-c,d)pyrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U

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SAMPLE NO: 9710430\*2

Received: 10.22.97

Ms. Mary Schneider  
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2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 6

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
9710430*2 18609-711						10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 9.9% moisture)							
Semi-volatiles							
N-Nitrosodiphenylamine	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Nitrobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Naphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Phenanthrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Phenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Pentachlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	730	U
Pyrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-chloroethoxy)methane	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-chloroisopropyl)ether	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-ethylhexyl)phthalate	8270B	10.23.97	10.28.97	1	ug/kg	120	J
Surrogates **							
2-Fluorobiphenyl Reported	8270B	10.23.97	10.28.97	1	Percent	111	
2-Fluorophenol Reported	8270B	10.23.97	10.28.97	1	Percent	96	
2,4,6-Tribromophenol Rep.	8270B	10.23.97	10.28.97	1	Percent	115	
Nitrobenzene-d5 Reported	8270B	10.23.97	10.28.97	1	Percent	110	
Phenol-d5 Reported	8270B	10.23.97	10.28.97	1	Percent	108	
Terphenyl-d14 Reported	8270B	10.23.97	10.28.97	1	Percent	97	



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SAMPLE NO: 9710430\*2

Received: 10.22.97

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2031 Main Street  
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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 7

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*2	18609-711	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 9.9% moisture)

## Pesticides

Aldrin	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
o,p'-DDD	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
o,p'-DDE	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
p,p'-DDT	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Dieldrin	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endosulfan I	8081	10.24.97	10.29.97	1	ug/kg	0.78	U
Endosulfan II	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endosulfan sulfate	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endrin	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endrin aldehyde	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endrin Ketone	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Heptachlor epoxide	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Heptachlor	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Methoxychlor	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Toxaphene	8081	10.24.97	10.29.97	1	ug/kg	190	U
BHC, alpha isomer	8081	10.24.97	10.29.97	1	ug/kg	0.78	U
alpha-Chlordane	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
BHC, beta isomer	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
BHC, delta isomer	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
BHC, gamma isomer (Lindane)	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
gamma-Chlordane	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Surrogates **							

0000286

SAMPLE NO: 9710430\*2

Received: 10.22.97

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P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 8

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*2	18609-711	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 9.9% moisture)

## Pesticides

Decachlorobiphenyl Reported	8081	10.24.97	10.29.97	1	Percent	93
Tetrachloro-meta-xylene Rpt	8081	10.24.97	10.29.97	1	Percent	70

000030

SAMPLE NO: 9710430\*2

Received: 10.22.97

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2031 Main Street  
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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 9

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*2 18609-711 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 9.9% moisture)

## Polychlorinated Biphenyls

Aroclor 1016	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1221	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1232	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1242	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1248	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1254	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1260	8081	10.24.97	10.29.97	1	ug/kg	37	U
Surrogates **							
Decachlorobiphenyl Reported	8081	10.24.97	10.29.97	1	Percent	93	
Tetrachloro-meta-xylene Rpt	8081	10.24.97	10.29.97	1	Percent	70	

## ANALYTICAL REPORT

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SAMPLE NO: 9710430\*2

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Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*2 18609-711 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 9.9% moisture)

Total Cyanide	9010A	10.24.97	10.24.97	1	mg/kg	0.55	U
pH	9045		10.24.97	1	Units	8.9	
-Moisture/TNFR	D2216		10.24.97	1	Percent	9.9	
Aluminum	6010A	10.27.97	10.28.97	1	mg/kg	6900	
Antimony	6010A	10.27.97	10.28.97	1	mg/kg	5.5	U
Arsenic	7060A	10.27.97	10.28.97	1	mg/kg	1.7	
Barium	6010A	10.27.97	10.28.97	1	mg/kg	180	
Beryllium	6010A	10.27.97	10.28.97	1	mg/kg	0.40	
Cadmium	6010A	10.27.97	10.28.97	1	mg/kg	0.55	U
Calcium	6010A	10.27.97	10.28.97	1	mg/kg	8500	
Chromium	6010A	10.27.97	10.28.97	1	mg/kg	9.1	
Cobalt	6010A	10.27.97	10.28.97	1	mg/kg	5.7	
Copper	6010A	10.27.97	10.28.97	1	mg/kg	5.7	
Iron	6010A	10.27.97	10.28.97	1	mg/kg	11000	
Lead	7421	10.27.97	10.28.97	1	mg/kg	1.7	
Magnesium	6010A	10.27.97	10.28.97	1	mg/kg	5300	
Manganese	6010A	10.27.97	10.28.97	1	mg/kg	210	
Mercury	7471A	10.24.97	10.27.97	1	mg/kg	0.089	U
Molybdenum	6010A	10.27.97	10.28.97	1	mg/kg	2.2	U
Nickel	6010A	10.27.97	10.28.97	1	mg/kg	5.9	
Potassium	6010A	10.27.97	10.28.97	1	mg/kg	3400	
Selenium	7740	10.27.97	10.28.97	1	mg/kg	0.55	U
Silver	6010A	10.27.97	10.28.97	1	mg/kg	1.1	U
Sodium	6010A	10.27.97	10.28.97	1	mg/kg	310	

000023

SAMPLE NO: 9710430\*2

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
-----							
9710430*2	18609-711						10.21.97
-----							
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							
(Following results reported on the basis of 9.9% moisture)							
Thallium	6010A	10.27.97	10.28.97	1	mg/kg	5.5	U
Radon	6010A	10.27.97	10.28.97	1	mg/kg	24	
Radon	6010A	10.27.97	10.28.97	1	mg/kg	44	
Digestion	3050	10.27.97	10.27.97	1	Date	10/27/97	
Furnace Digestion	3050	10.27.97	10.27.97	1	Date	10/27/97	
-----							

000140

SAMPLE NO: 9710430\*12

Received: 10.22.97

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Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
9710430*12 18609-712							10.21.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 14.0% moisture)							
Volatiles							
1,1,1-Trichloroethane	8260A		10.28.97	1	ug/kg	5.8	U
1,1,2,2-Tetrachloroethane	8260A		10.28.97	1	ug/kg	5.8	U
1,1,2-Trichloroethane	8260A		10.28.97	1	ug/kg	5.8	U
1,1-Dichloroethane	8260A		10.28.97	1	ug/kg	5.8	U
1,1-Dichloroethene	8260A		10.28.97	1	ug/kg	5.8	U
1,2-Dichloroethane	8260A		10.28.97	1	ug/kg	5.8	U
1,2-Dichloropropane	8260A		10.28.97	1	ug/kg	5.8	U
2-Chloroethylvinylether	8260A		10.28.97	1	ug/kg	58	U
2-Hexanone	8260A		10.28.97	1	ug/kg	58	U
Acetone	8260A		10.28.97	1	ug/kg	58	U
Bromodichloromethane	8260A		10.28.97	1	ug/kg	5.8	U
Bromomethane	8260A		10.28.97	1	ug/kg	5.8	U
Benzene	8260A		10.28.97	1	ug/kg	5.8	U
Bromoform	8260A		10.28.97	1	ug/kg	5.8	U
Chlorobenzene	8260A		10.28.97	1	ug/kg	5.8	U
Carbon Tetrachloride	8260A		10.28.97	1	ug/kg	5.8	U
Chloroethane	8260A		10.28.97	1	ug/kg	5.8	U
Chloroform	8260A		10.28.97	1	ug/kg	5.8	U
Chloromethane	8260A		10.28.97	1	ug/kg	5.8	U
Carbon Disulfide	8260A		10.28.97	1	ug/kg	5.8	U
Dibromochloromethane	8260A		10.28.97	1	ug/kg	5.8	U
Ethylbenzene	8260A		10.28.97	1	ug/kg	5.8	U
Methyl ethyl ketone	8260A		10.28.97	1	ug/kg	58	U
Methyl isobutyl ketone	8260A		10.28.97	1	ug/kg	58	U

SAMPLE NO: 9710430\*12

Received: 10.22.97

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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
-----						-----	
9710430*12	18609-712					10.21.97	
-----						-----	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							
(Following results reported on the basis of 14.0% moisture)							
Volatiles							
Methyl-tert-butylether	8260A		10.28.97	1	ug/kg	12	U
Methylene chloride	8260A		10.28.97	1	ug/kg	5.8	U
Xyrene	8260A		10.28.97	1	ug/kg	5.8	U
Trichloroethene	8260A		10.28.97	1	ug/kg	5.8	U
Toluene	8260A		10.28.97	1	ug/kg	5.8	U
Tetrachloroethene	8260A		10.28.97	1	ug/kg	5.8	U
Vinyl acetate	8260A		10.28.97	1	ug/kg	12	U
Vinyl chloride	8260A		10.28.97	1	ug/kg	5.8	U
Total Xylene Isomers	8260A		10.28.97	1	ug/kg	17	U
cis-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	5.8	U
cis-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	5.8	U
trans-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	5.8	U
trans-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	5.8	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		10.28.97	1	Percent	79	
4-Bromofluorobenzene Rep.	8260A		10.28.97	1	Percent	101	
Toluene-d8 Reported	8260A		10.28.97	1	Percent	100	
Dibromofluoromethane Rep.	8260A		10.28.97	1	Percent	91	
-----							

# ANALYTICAL REPORT

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SAMPLE NO: 9710430\*12

Received: 10.22.97

Mailed:

Ms. Mary Schneider  
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Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED	
9710430*12	18609-712						10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG	
(Following results reported on the basis of 14.0% moisture)								
-Moisture/TNFR	D2216		10.30.97	1	Percent	14		



000136

SAMPLE NO: 9710430\*3

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 11

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*3 18609-713 10.21.97

PARAMETER METHOD PREPED ANALYZED DIL UNITS RESULT FLG

(Following results reported on the basis of 12.0% moisture)

Mod 8015 - Gas

TPH (Gasoline Range) 8015M 10.24.97 1 mg/kg 11 U

Surrogates \*\*

1,1,1-Trifluorotoluene Rep. 8015M 10.24.97 1 Percent 103

000135

SAMPLE NO: 9710430\*3

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 10

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED	
9710430*3		18609-713					10.21.97	
PARAMETER		METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 12.0% moisture)								
JP-5								
TPH (Diesel Range)		8015M	10.24.97	10.28.97	1	mg/kg	11	U
JP-5		8015M	10.24.97	10.28.97	1	mg/kg	11	U
Surrogates	**							
Naphthalene	Reported	8015M	10.24.97	10.28.97	1	Percent	81	
o-Terphenyl	Reported	8015M	10.24.97	10.28.97	1	Percent	98	

000137

SAMPLE NO: 9710430\*3

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 12

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*3 18609-713 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 12.0% moisture)

## Volatiles

1,1,1-Trichloroethane	8260A		10.28.97	1	ug/kg	5.7	U
1,2,2-Tetrachloroethane	8260A		10.28.97	1	ug/kg	5.7	U
1,1,2-Trichloroethane	8260A		10.28.97	1	ug/kg	5.7	U
1,1-Dichloroethane	8260A		10.28.97	1	ug/kg	5.7	U
1,1-Dichloroethene	8260A		10.28.97	1	ug/kg	5.7	U
1,2-Dichloroethane	8260A		10.28.97	1	ug/kg	5.7	U
1,2-Dichloropropane	8260A		10.28.97	1	ug/kg	5.7	U
2-Chloroethylvinylether	8260A		10.28.97	1	ug/kg	57	U
2-Hexanone	8260A		10.28.97	1	ug/kg	57	U
Acetone	8260A		10.28.97	1	ug/kg	57	U
Bromodichloromethane	8260A		10.28.97	1	ug/kg	5.7	U
Bromomethane	8260A		10.28.97	1	ug/kg	5.7	U
Benzene	8260A		10.28.97	1	ug/kg	5.7	U
Bromoform	8260A		10.28.97	1	ug/kg	5.7	U
Chlorobenzene	8260A		10.28.97	1	ug/kg	5.7	U
Carbon Tetrachloride	8260A		10.28.97	1	ug/kg	5.7	U
Chloroethane	8260A		10.28.97	1	ug/kg	5.7	U
Chloroform	8260A		10.28.97	1	ug/kg	5.7	U
Chloromethane	8260A		10.28.97	1	ug/kg	5.7	U
Dibromochloromethane	8260A		10.28.97	1	ug/kg	5.7	U
Ethylbenzene	8260A		10.28.97	1	ug/kg	5.7	U
Methyl ethyl ketone	8260A		10.28.97	1	ug/kg	57	U
Methyl isobutyl ketone	8260A		10.28.97	1	ug/kg	57	U
Methyl-tert-butylether	8260A		10.28.97	1	ug/kg	11	U

000138

SAMPLE NO: 9710430\*3

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 13

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*3 18609-713 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 12.0% moisture)

## Volatiles

Methylene chloride	8260A		10.28.97	1	ug/kg	5.7	U
Styrene	8260A		10.28.97	1	ug/kg	5.7	U
Trichloroethene	8260A		10.28.97	1	ug/kg	5.7	U
Toluene	8260A		10.28.97	1	ug/kg	5.7	U
Tetrachloroethene	8260A		10.28.97	1	ug/kg	5.7	U
Vinyl acetate	8260A		10.28.97	1	ug/kg	11	U
Vinyl chloride	8260A		10.28.97	1	ug/kg	5.7	U
Total Xylene Isomers	8260A		10.28.97	1	ug/kg	17	U
cis-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	5.7	U
cis-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	5.7	U
trans-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	5.7	U
trans-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	5.7	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		10.28.97	1	Percent	75	
4-Bromofluorobenzene Rep.	8260A		10.28.97	1	Percent	101	
Toluene-d8 Reported	8260A		10.28.97	1	Percent	97	
Dibromofluoromethane Rep.	8260A		10.28.97	1	Percent	91	

000128

SAMPLE NO: 9710430\*3

Received: 10.22.97

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P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*3 18609-713 10.21.97

PARAMETER METHOD PREPED ANALYZED DIL UNITS RESULT FLG

(Following results reported on the basis of 12.0% moisture)

## Compounds by SIM

Benzo(a)pyrene	8270.S	10.23.97	10.28.97	1	ug/kg	37	U
Benzo(a,h)anthracene	8270.S	10.23.97	10.28.97	1	ug/kg	37	U
Nitrosodi-n-propylamine	8270.S	10.23.97	10.28.97	1	ug/kg	37	U
Bis(2-chloroethyl)ether	8270.S	10.23.97	10.28.97	1	ug/kg	37	U
Surrogates **							
2-Fluorobiphenyl Reported	8270.S	10.23.97	10.28.97	1	Percent	50	
Terphenyl-d14 Reported	8270.S	10.23.97	10.28.97	1	Percent	53	

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SAMPLE NO: 9710430\*3

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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 4

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
9710430*3 18609-713							10.21.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 12.0% moisture)							
Semi-volatiles							
1,2,4-Trichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,2-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,3-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,4-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4,5-Trichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4,6-Trichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dimethylphenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dinitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	940	U
2,4-Dinitrotoluene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,6-Dinitrotoluene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Chloronaphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Chlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Methyl-4,6-dinitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	940	U
2-Methylnaphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Methylphenol (o-Cresol)	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Nitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
3,3'-Dichlorobenzidine	8270B	10.23.97	10.28.97	1	ug/kg	370	U
3-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Bromophenylphenylether	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chloro-3-methylphenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chloroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chlorophenylphenylether	8270B	10.23.97	10.28.97	1	ug/kg	370	U

000130

SAMPLE NO: 9710430\*3

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 5

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*3 18609-713 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 12.0% moisture)

## Semi-volatiles

4-Methylphenol (p-Cresol)	8270B	10.23.97	10.28.97	1	ug/kg	370	U
-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Nitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	940	U
Acenaphthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Acenaphthylene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Anthracene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(a)anthracene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(b)fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(g,h,i)perylene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(k)fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Butylbenzylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Chrysene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Di-n-octylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dibenzofuran	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dibutylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Diethylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dimethylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Fluorene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorobutadiene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorocyclopentadiene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachloroethane	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Indeno(1,2,3-c,d)pyrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U

000131

SAMPLE NO: 9710430\*3

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
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Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 6

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
9710430*3 18609-713							10.21.97
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 12.0% moisture)							
Semi-volatiles							
N-Nitrosodiphenylamine	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Nitrobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Naphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Phenanthrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Phenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Pentachlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	750	U
Pyrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-chloroethoxy)methane	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-chloroisopropyl)ether	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-ethylhexyl)phthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Surrogates **							
2-Fluorobiphenyl Reported	8270B	10.23.97	10.28.97	1	Percent	97	
2-Fluorophenol Reported	8270B	10.23.97	10.28.97	1	Percent	83	
2,4,6-Tribromophenol Rep.	8270B	10.23.97	10.28.97	1	Percent	100	
Nitrobenzene-d5 Reported	8270B	10.23.97	10.28.97	1	Percent	95	
Phenol-d5 Reported	8270B	10.23.97	10.28.97	1	Percent	94	
Terphenyl-d14 Reported	8270B	10.23.97	10.28.97	1	Percent	84	



000132A

SAMPLE NO: 9710430\*3

Received: 10.22.97

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 7

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*3 18609-713 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 12.0% moisture)

## Pesticides

Aldrin	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
p,p'-DDD	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
p,p'-DDE	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
p,p'-DDT	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Dieldrin	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Endosulfan I	8081	10.24.97	10.29.97	1	ug/kg	0.8	U
Endosulfan II	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Endosulfan sulfate	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Endrin	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Endrin aldehyde	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Endrin Ketone	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Heptachlor epoxide	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Heptachlor	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Methoxychlor	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Toxaphene	8081	10.24.97	10.29.97	1	ug/kg	190	U
BHC, alpha isomer	8081	10.24.97	10.29.97	1	ug/kg	0.8	U
alpha-Chlordane	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
BHC, beta isomer	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
BHC, delta isomer	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
BHC, gamma isomer (Lindane)	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
gamma-Chlordane	8081	10.24.97	10.29.97	1	ug/kg	2.3	U
Surrogates **							

000132B

SAMPLE NO: 9710430\*3

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 8

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9710430*3	18609-713						10.21.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							-----
(Following results reported on the basis of 12.0% moisture)							
Pesticides							
Decachlorobiphenyl Reported	8081	10.24.97	10.29.97	1	Percent	87	
Tetrachloro-meta-xylene Rpt	8081	10.24.97	10.29.97	1	Percent	73	
-----							-----

000134

SAMPLE NO: 9710430\*3

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Ms. Mary Schneider  
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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 9

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED	
9710430*3 18609-713							10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG	
(Following results reported on the basis of 12.0% moisture)								
Polychlorinated Biphenyls								
Aroclor 1016	8081	10.24.97	10.29.97	1	ug/kg	37	U	
Aroclor 1221	8081	10.24.97	10.29.97	1	ug/kg	37	U	
Aroclor 1232	8081	10.24.97	10.29.97	1	ug/kg	37	U	
Aroclor 1242	8081	10.24.97	10.29.97	1	ug/kg	37	U	
Aroclor 1248	8081	10.24.97	10.29.97	1	ug/kg	37	U	
Aroclor 1254	8081	10.24.97	10.29.97	1	ug/kg	37	U	
Aroclor 1260	8081	10.24.97	10.29.97	1	ug/kg	37	U	
Surrogates **								
Decachlorobiphenyl Reported	8081	10.24.97	10.29.97	1	Percent	87		
Tetrachloro-meta-xylene Rpt	8081	10.24.97	10.29.97	1	Percent	73		

## ANALYTICAL REPORT

000126

SAMPLE NO: 9710430\*3

Received: 10.22.97

Mailed:

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*3 18609-713 10.21.97

PARAMETER	METHOD	PREP	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 12.0% moisture)

Total Cyanide	9010A	10.24.97	10.24.97	1	mg/kg	0.57	U
pH	9045		10.24.97	1	Units	8.1	
-Moisture/TNFR	D2216		10.24.97	1	Percent	12	
Aluminum	6010A	10.27.97	10.28.97	1	mg/kg	9800	
Antimony	6010A	10.27.97	10.28.97	1	mg/kg	5.7	U
Arsenic	7060A	10.27.97	10.28.97	1	mg/kg	1.6	
Barium	6010A	10.27.97	10.28.97	1	mg/kg	140	
Beryllium	6010A	10.27.97	10.28.97	1	mg/kg	0.48	
Cadmium	6010A	10.27.97	10.28.97	1	mg/kg	0.57	U
Calcium	6010A	10.27.97	10.28.97	1	mg/kg	4200	
Chromium	6010A	10.27.97	10.28.97	1	mg/kg	10.0	
Cobalt	6010A	10.27.97	10.28.97	1	mg/kg	6.2	
Copper	6010A	10.27.97	10.28.97	1	mg/kg	6.5	
Iron	6010A	10.27.97	10.28.97	5	mg/kg	16000	
Lead	7421	10.27.97	10.28.97	1	mg/kg	2.0	
Magnesium	6010A	10.27.97	10.28.97	1	mg/kg	5600	
Manganese	6010A	10.27.97	10.28.97	1	mg/kg	250	
Mercury	7471A	10.24.97	10.27.97	1	mg/kg	0.091	U
Molybdenum	6010A	10.27.97	10.28.97	1	mg/kg	2.3	U
Nickel	6010A	10.27.97	10.28.97	1	mg/kg	6.5	
Potassium	6010A	10.27.97	10.28.97	1	mg/kg	4500	
Selenium	7740	10.27.97	10.28.97	1	mg/kg	0.57	U
Silver	6010A	10.27.97	10.28.97	1	mg/kg	1.1	U
Sodium	6010A	10.27.97	10.28.97	1	mg/kg	180	

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SAMPLE NO: 9710430\*3

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*3 18609-713 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
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(Following results reported on the basis of 12.0% moisture)

Thallium	6010A	10.27.97	10.28.97	1	mg/kg	5.7	U
Barium	6010A	10.27.97	10.28.97	1	mg/kg	30	
Cadmium	6010A	10.27.97	10.28.97	1	mg/kg	50	
Digestion	3050	10.27.97	10.27.97	1	Date	10/27/97	
Furnace Digestion	3050	10.27.97	10.27.97	1	Date	10/27/97	

000143

SAMPLE NO: 9710430\*13

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
9710430*13 18609-714						10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 6.9% moisture)							
Volatiles							
1,1,1-Trichloroethane	8260A		10.29.97	1	ug/kg	5.4	U
1,1,2,2-Tetrachloroethane	8260A		10.29.97	1	ug/kg	5.4	U
1,1,2-Trichloroethane	8260A		10.29.97	1	ug/kg	5.4	U
1,1-Dichloroethane	8260A		10.29.97	1	ug/kg	5.4	U
1,1-Dichloroethene	8260A		10.29.97	1	ug/kg	5.4	U
1,2-Dichloroethane	8260A		10.29.97	1	ug/kg	5.4	U
1,2-Dichloropropane	8260A		10.29.97	1	ug/kg	5.4	U
2-Chloroethylvinylether	8260A		10.29.97	1	ug/kg	54	U
2-Hexanone	8260A		10.29.97	1	ug/kg	54	U
Acetone	8260A		10.29.97	1	ug/kg	54	U
Bromodichloromethane	8260A		10.29.97	1	ug/kg	5.4	U
Bromomethane	8260A		10.29.97	1	ug/kg	5.4	U
Benzene	8260A		10.29.97	1	ug/kg	5.4	U
Bromoform	8260A		10.29.97	1	ug/kg	5.4	U
Chlorobenzene	8260A		10.29.97	1	ug/kg	5.4	U
Carbon Tetrachloride	8260A		10.29.97	1	ug/kg	5.4	U
Chloroethane	8260A		10.29.97	1	ug/kg	5.4	U
Chloroform	8260A		10.29.97	1	ug/kg	5.4	U
Chloromethane	8260A		10.29.97	1	ug/kg	5.4	U
Carbon Disulfide	8260A		10.29.97	1	ug/kg	5.4	U
Dibromochloromethane	8260A		10.29.97	1	ug/kg	5.4	U
Ethylbenzene	8260A		10.29.97	1	ug/kg	5.4	U
Methyl ethyl ketone	8260A		10.29.97	1	ug/kg	54	U
Methyl isobutyl ketone	8260A		10.29.97	1	ug/kg	54	U

SAMPLE NO: 9710430\*13

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*13 18609-714 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 6.9% moisture)

## Volatiles

Methyl-tert-butylether	8260A		10.29.97	1	ug/kg	11	U
Methylene chloride	8260A		10.29.97	1	ug/kg	5.4	U
Pyrene	8260A		10.29.97	1	ug/kg	5.4	U
Trichloroethene	8260A		10.29.97	1	ug/kg	5.4	U
Toluene	8260A		10.29.97	1	ug/kg	5.4	U
Tetrachloroethene	8260A		10.29.97	1	ug/kg	5.4	U
Vinyl acetate	8260A		10.29.97	1	ug/kg	11	U
Vinyl chloride	8260A		10.29.97	1	ug/kg	5.4	U
Total Xylene Isomers	8260A		10.29.97	1	ug/kg	16	U
cis-1,2-Dichloroethene	8260A		10.29.97	1	ug/kg	5.4	U
cis-1,3-Dichloropropene	8260A		10.29.97	1	ug/kg	5.4	U
trans-1,2-Dichloroethene	8260A		10.29.97	1	ug/kg	5.4	U
trans-1,3-Dichloropropene	8260A		10.29.97	1	ug/kg	5.4	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		10.29.97	1	Percent	80	
4-Bromofluorobenzene Rep.	8260A		10.29.97	1	Percent	101	
Toluene-d8 Reported	8260A		10.29.97	1	Percent	98	
Dibromofluoromethane Rep.	8260A		10.29.97	1	Percent	90	

# ANALYTICAL REPORT

000142

SAMPLE NO: 9710430\*13

Received: 10.22.97

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Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

### SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*13 18609-714 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 6.9% moisture)

-Moisture/TNFR	D2216		10.30.97	1	Percent	6.9	
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000045

SAMPLE NO: 9710430\*4

Received: 10.22.97

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2031 Main Street  
Irvine, CA 92614

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 11

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED	
-----							-----	
9710430*4	18609-715						10.21.97	
-----							-----	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG	
-----								
(Following results reported on the basis of 11.0% moisture)								
Mod 8015 - Gas								
TPH (Gasoline Range)	8015M		10.24.97	1	mg/kg	11	U	
Surrogates **								
,a,a-Trifluorotoluene Rep.	8015M		10.24.97	1	Percent	99		
-----								

000044

SAMPLE NO: 9710430\*4

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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 10

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*4 18609-715 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

JP-5

TPH (Diesel Range)	8015M	10.24.97	10.28.97	1	mg/kg	11	U
JP-5	8015M	10.24.97	10.28.97	1	mg/kg	11	U
Surrogates **							
Naphthalene Reported	8015M	10.24.97	10.28.97	1	Percent	83	
o-Terphenyl Reported	8015M	10.24.97	10.28.97	1	Percent	100	

000046

SAMPLE NO: 9710430\*4

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 12

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
-----						-----	
9710430*4	18609-715					10.21.97	
-----		-----					
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							
(Following results reported on the basis of 11.0% moisture)							
Volatiles							
1,1,1-Trichloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,1,2,2-Tetrachloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,1,2-Trichloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,1-Dichloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,1-Dichloroethene	8260A		10.28.97	1	ug/kg	5.6	U
1,2-Dichloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,2-Dichloropropane	8260A		10.28.97	1	ug/kg	5.6	U
2-Chloroethylvinylether	8260A		10.28.97	1	ug/kg	56	U
2-Hexanone	8260A		10.28.97	1	ug/kg	56	U
Acetone	8260A		10.28.97	1	ug/kg	56	U
Bromodichloromethane	8260A		10.28.97	1	ug/kg	5.6	U
Bromomethane	8260A		10.28.97	1	ug/kg	5.6	U
Benzene	8260A		10.28.97	1	ug/kg	5.6	U
Bromoform	8260A		10.28.97	1	ug/kg	5.6	U
Chlorobenzene	8260A		10.28.97	1	ug/kg	5.6	U
Carbon Tetrachloride	8260A		10.28.97	1	ug/kg	5.6	U
Chloroethane	8260A		10.28.97	1	ug/kg	5.6	U
Chloroform	8260A		10.28.97	1	ug/kg	5.6	U
Chloromethane	8260A		10.28.97	1	ug/kg	5.6	U
Dibromochloromethane	8260A		10.28.97	1	ug/kg	5.6	U
Ethylbenzene	8260A		10.28.97	1	ug/kg	5.6	U
Methyl ethyl ketone	8260A		10.28.97	1	ug/kg	56	U
Methyl isobutyl ketone	8260A		10.28.97	1	ug/kg	56	U
Methyl-tert-butylether	8260A		10.28.97	1	ug/kg	11	U
-----						-----	

000047

SAMPLE NO: 9710430\*4

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Irvine, CA 92614

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 13

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*4 18609-715 10.21.97

PARAMETER METHOD PREPED ANALYZED DIL UNITS RESULT FLG

(Following results reported on the basis of 11.0% moisture)

## Volatiles

Methylene chloride	8260A	10.28.97	1	ug/kg	5.6	U
Styrene	8260A	10.28.97	1	ug/kg	5.6	U
Trichloroethene	8260A	10.28.97	1	ug/kg	5.6	U
Toluene	8260A	10.28.97	1	ug/kg	5.6	U
Tetrachloroethene	8260A	10.28.97	1	ug/kg	5.6	U
Vinyl acetate	8260A	10.28.97	1	ug/kg	11	U
Vinyl chloride	8260A	10.28.97	1	ug/kg	5.6	U
Total Xylene Isomers	8260A	10.28.97	1	ug/kg	17	U
cis-1,2-Dichloroethene	8260A	10.28.97	1	ug/kg	5.6	U
cis-1,3-Dichloropropene	8260A	10.28.97	1	ug/kg	5.6	U
trans-1,2-Dichloroethene	8260A	10.28.97	1	ug/kg	5.6	U
trans-1,3-Dichloropropene	8260A	10.28.97	1	ug/kg	5.6	U
Surrogates **						
1,2-Dichloroethane-d4 Rep.	8260A	10.28.97	1	Percent	78	
4-Bromofluorobenzene Rep.	8260A	10.28.97	1	Percent	102	
Toluene-d8 Reported	8260A	10.28.97	1	Percent	95	
Dibromofluoromethane Rep.	8260A	10.28.97	1	Percent	93	

000037

SAMPLE NO: 9710430\*4

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED	
-----							-----	
9710430*4	18609-715						10.21.97	
-----							-----	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG	
-----								
(Following results reported on the basis of 11.0% moisture)								
Compounds by SIM								
Benzo(a)pyrene	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
7ibenzo(a,h)anthracene	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
1-Nitrosodi-n-propylamine	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
Bis(2-chloroethyl)ether	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
Surrogates **								
2-Fluorobiphenyl Reported	8270.S	10.23.97	10.28.97	1	Percent	48		
Terphenyl-d14 Reported	8270.S	10.23.97	10.28.97	1	Percent	49		
-----								

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SAMPLE NO: 9710430\*4

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 4

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*4	18609-715	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Semi-volatiles

1,2,4-Trichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,2-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,3-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,4-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4,5-Trichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4,6-Trichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dimethylphenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dinitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	930	U
2,4-Dinitrotoluene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,6-Dinitrotoluene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Chloronaphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Chlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Methyl-4,6-dinitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	930	U
2-Methylnaphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Methylphenol (o-Cresol)	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Nitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
3,3'-Dichlorobenzidine	8270B	10.23.97	10.28.97	1	ug/kg	370	U
3-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Bromophenylphenylether	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chloro-3-methylphenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chloroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chlorophenylphenylether	8270B	10.23.97	10.28.97	1	ug/kg	370	U

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SAMPLE NO: 9710430\*4

Received: 10.22.97

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OHM Remediation Services Corp.  
2031 Main Street  
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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 5

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9710430*4	18609-715						10.21.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							-----
(Following results reported on the basis of 11.0% moisture)							
Semi-volatiles							
4-Methylphenol (p-Cresol)	8270B	10.23.97	10.28.97	1	ug/kg	370	U
-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
-Nitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	930	U
Acenaphthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Acenaphthylene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Anthracene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(a)anthracene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(b)fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(g,h,i)perylene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(k)fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Butylbenzylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Chrysene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Di-n-octylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dibenzofuran	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dibutylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Diethylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dimethylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Fluorene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorobutadiene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorocyclopentadiene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachloroethane	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Indeno(1,2,3-c,d)pyrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
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000040

SAMPLE NO: 9710430\*4

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
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P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 6

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*4 18609-715 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Semi-volatiles

N-Nitrosodiphenylamine	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Nitrobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Naphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Phenanthrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Phenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Pentachlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	740	U
Pyrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-chloroethoxy)methane	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-chloroisopropyl)ether	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-ethylhexyl)phthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Surrogates **							
2-Fluorobiphenyl Reported	8270B	10.23.97	10.28.97	1	Percent	94	
2-Fluorophenol Reported	8270B	10.23.97	10.28.97	1	Percent	78	
2,4,6-Tribromophenol Rep.	8270B	10.23.97	10.28.97	1	Percent	95	
Nitrobenzene-d5 Reported	8270B	10.23.97	10.28.97	1	Percent	90	
Phenol-d5 Reported	8270B	10.23.97	10.28.97	1	Percent	88	
Terphenyl-d14 Reported	8270B	10.23.97	10.28.97	1	Percent	79	



000041A

SAMPLE NO: 9710430\*4

Received: 10.22.97

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P.O.#: 1040171  
Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 7

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*4	18609-715	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Pesticides

Aldrin	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
o,p'-DDD	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
p,p'-DDE	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
p,p'-DDT	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Dieldrin	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endosulfan I	8081	10.24.97	10.29.97	1	ug/kg	0.79	U
Endosulfan II	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endosulfan sulfate	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endrin	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endrin aldehyde	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endrin Ketone	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Heptachlor epoxide	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Heptachlor	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Methoxychlor	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Toxaphene	8081	10.24.97	10.29.97	1	ug/kg	190	U
BHC, alpha isomer	8081	10.24.97	10.29.97	1	ug/kg	0.79	U
alpha-Chlordane	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
BHC, beta isomer	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
BHC, delta isomer	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
BHC, gamma isomer (Lindane)	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
gamma-Chlordane	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Surrogates **							

000041B

SAMPLE NO: 9710430\*4

Received: 10.22.97

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 8

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

-----  
9710430\*4      18609-715      10.21.97  
-----

-----  
PARAMETER      METHOD   PREPED   ANALYZED   DIL   UNITS   RESULT   FLG  
-----

(Following results reported on the basis of 11.0% moisture)

## Pesticides

-----  
Decachlorobiphenyl Reported   8081   10.24.97   10.29.97   1   Percent   88  
Tetrachloro-meta-xylene Rpt   8081   10.24.97   10.29.97   1   Percent   74  
-----

000043

SAMPLE NO: 9710430\*4

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## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 9

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
9710430*4	18609-715					10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 11.0% moisture)							
Polychlorinated Biphenyls							
Aroclor 1016	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1221	8081	10.24.97	10.29.97	1	ug/kg	37	U
roclor 1232	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1242	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1248	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1254	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1260	8081	10.24.97	10.29.97	1	ug/kg	37	U
Surrogates **							
Decachlorobiphenyl Reported	8081	10.24.97	10.29.97	1	Percent	88	
Tetrachloro-meta-xylene Rpt	8081	10.24.97	10.29.97	1	Percent	74	

## ANALYTICAL REPORT

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## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*4 18609-715 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

Total Cyanide	9010A	10.24.97	10.24.97	1	mg/kg	0.56	U
pH	9045		10.24.97	1	Units	8.0	
-Moisture/TNFR	D2216		10.24.97	1	Percent	11	
Aluminum	6010A	10.27.97	10.28.97	1	mg/kg	11000	
Antimony	6010A	10.27.97	10.28.97	1	mg/kg	5.6	U
Arsenic	7060A	10.27.97	10.28.97	1	mg/kg	1.00	
Barium	6010A	10.27.97	10.28.97	1	mg/kg	130	
Beryllium	6010A	10.27.97	10.28.97	1	mg/kg	0.56	
Cadmium	6010A	10.27.97	10.28.97	1	mg/kg	0.56	U
Calcium	6010A	10.27.97	10.28.97	1	mg/kg	4300	
Chromium	6010A	10.27.97	10.28.97	1	mg/kg	12	
Cobalt	6010A	10.27.97	10.28.97	1	mg/kg	6.7	
Copper	6010A	10.27.97	10.28.97	1	mg/kg	7.3	
Iron	6010A	10.27.97	10.28.97	5	mg/kg	18000	
Lead	7421	10.27.97	10.28.97	1	mg/kg	1.9	
Magnesium	6010A	10.27.97	10.28.97	1	mg/kg	6400	
Manganese	6010A	10.27.97	10.28.97	1	mg/kg	260	
Mercury	7471A	10.24.97	10.27.97	1	mg/kg	0.09	U
Molybdenum	6010A	10.27.97	10.28.97	1	mg/kg	2.2	U
Nickel	6010A	10.27.97	10.28.97	1	mg/kg	8.9	
Potassium	6010A	10.27.97	10.28.97	1	mg/kg	4900	
Selenium	7740	10.27.97	10.28.97	1	mg/kg	0.56	U
Silver	6010A	10.27.97	10.28.97	1	mg/kg	1.1	U
Sodium	6010A	10.27.97	10.28.97	1	mg/kg	180	

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SAMPLE NO: 9710430\*4

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*4 18609-715 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

Thallium	6010A	10.27.97	10.28.97	1	mg/kg	3.8	J
adium	6010A	10.27.97	10.28.97	1	mg/kg	35	
ic	6010A	10.27.97	10.28.97	1	mg/kg	54	
Digestion	3050	10.27.97	10.27.97	1	Date	10/27/97	
Furnace Digestion	3050	10.27.97	10.27.97	1	Date	10/27/97	

000146

SAMPLE NO: 9710430\*14

Received: 10.22.97

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*14	18609-716	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 18.0% moisture)

## Volatiles

1,1,1-Trichloroethane	8260A	10.29.97	1	ug/kg	6.1	U
1,1,2,2-Tetrachloroethane	8260A	10.29.97	1	ug/kg	6.1	U
1,1,2-Trichloroethane	8260A	10.29.97	1	ug/kg	6.1	U
1,1-Dichloroethane	8260A	10.29.97	1	ug/kg	6.1	U
1,1-Dichloroethene	8260A	10.29.97	1	ug/kg	6.1	U
1,2-Dichloroethane	8260A	10.29.97	1	ug/kg	6.1	U
1,2-Dichloropropane	8260A	10.29.97	1	ug/kg	6.1	U
2-Chloroethylvinylether	8260A	10.29.97	1	ug/kg	61	U
2-Hexanone	8260A	10.29.97	1	ug/kg	61	U
Acetone	8260A	10.29.97	1	ug/kg	61	U
Bromodichloromethane	8260A	10.29.97	1	ug/kg	6.1	U
Bromomethane	8260A	10.29.97	1	ug/kg	6.1	U
Benzene	8260A	10.29.97	1	ug/kg	6.1	U
Bromoform	8260A	10.29.97	1	ug/kg	6.1	U
Chlorobenzene	8260A	10.29.97	1	ug/kg	6.1	U
Carbon Tetrachloride	8260A	10.29.97	1	ug/kg	6.1	U
Chloroethane	8260A	10.29.97	1	ug/kg	6.1	U
Chloroform	8260A	10.29.97	1	ug/kg	6.1	U
Chloromethane	8260A	10.29.97	1	ug/kg	6.1	U
Carbon Disulfide	8260A	10.29.97	1	ug/kg	6.1	U
Dibromochloromethane	8260A	10.29.97	1	ug/kg	6.1	U
Ethylbenzene	8260A	10.29.97	1	ug/kg	6.1	U
Methyl ethyl ketone	8260A	10.29.97	1	ug/kg	61	U
Methyl isobutyl ketone	8260A	10.29.97	1	ug/kg	61	U

SAMPLE NO: 9710430\*14

Received: 10.22.97

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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*14 18609-716 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 18.0% moisture)

## Volatiles

Methyl-tert-butylether	8260A		10.29.97	1	ug/kg	12	U
Ethylene chloride	8260A		10.29.97	1	ug/kg	6.1	U
Xyrene	8260A		10.29.97	1	ug/kg	6.1	U
Trichloroethene	8260A		10.29.97	1	ug/kg	6.1	U
Toluene	8260A		10.29.97	1	ug/kg	6.1	U
Tetrachloroethene	8260A		10.29.97	1	ug/kg	6.1	U
Vinyl acetate	8260A		10.29.97	1	ug/kg	12	U
Vinyl chloride	8260A		10.29.97	1	ug/kg	6.1	U
Total Xylene Isomers	8260A		10.29.97	1	ug/kg	18	U
cis-1,2-Dichloroethene	8260A		10.29.97	1	ug/kg	6.1	U
cis-1,3-Dichloropropene	8260A		10.29.97	1	ug/kg	6.1	U
trans-1,2-Dichloroethene	8260A		10.29.97	1	ug/kg	6.1	U
trans-1,3-Dichloropropene	8260A		10.29.97	1	ug/kg	6.1	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		10.29.97	1	Percent	77	
4-Bromofluorobenzene Rep.	8260A		10.29.97	1	Percent	103	
Toluene-d8 Reported	8260A		10.29.97	1	Percent	98	
Dibromofluoromethane Rep.	8260A		10.29.97	1	Percent	87	

# ANALYTICAL REPORT

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

### SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*14 18609-716 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 18.0% moisture)

-Moisture/TNFR	D2216		10.30.97	1	Percent	18	
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000058

SAMPLE NO: 9710430\*5

Received: 10.22.97

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2031 Main Street  
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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 11

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
9710430*5	18609-717					10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 11.0% moisture)							
Mod 8015 - Gas							
TPH (Gasoline Range)	8015M		10.24.97	1	mg/kg	11	U
Surrogates **							
a,a-Trifluorotoluene Rep.	8015M		10.24.97	1	Percent	106	

000057

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## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 10

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*5 18609-717 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

JP-5

TPH (Diesel Range)	8015M	10.24.97	10.28.97	1	mg/kg	11	U
JP-5	8015M	10.24.97	10.28.97	1	mg/kg	11	U
Surrogates **							
Naphthalene Reported	8015M	10.24.97	10.28.97	1	Percent	76	
o-Terphenyl Reported	8015M	10.24.97	10.28.97	1	Percent	92	

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## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 12

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*5 18609-717 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Volatiles

1,1,1-Trichloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,1,2,2-Tetrachloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,2-Trichloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,1-Dichloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,1-Dichloroethene	8260A		10.28.97	1	ug/kg	5.6	U
1,2-Dichloroethane	8260A		10.28.97	1	ug/kg	5.6	U
1,2-Dichloropropane	8260A		10.28.97	1	ug/kg	5.6	U
2-Chloroethylvinylether	8260A		10.28.97	1	ug/kg	56	U
2-Hexanone	8260A		10.28.97	1	ug/kg	56	U
Acetone	8260A		10.28.97	1	ug/kg	56	U
Bromodichloromethane	8260A		10.28.97	1	ug/kg	5.6	U
Bromomethane	8260A		10.28.97	1	ug/kg	5.6	U
Benzene	8260A		10.28.97	1	ug/kg	5.6	U
Bromoform	8260A		10.28.97	1	ug/kg	5.6	U
Chlorobenzene	8260A		10.28.97	1	ug/kg	5.6	U
Carbon Tetrachloride	8260A		10.28.97	1	ug/kg	5.6	U
Chloroethane	8260A		10.28.97	1	ug/kg	5.6	U
Chloroform	8260A		10.28.97	1	ug/kg	5.6	U
Chloromethane	8260A		10.28.97	1	ug/kg	5.6	U
Dibromochloromethane	8260A		10.28.97	1	ug/kg	5.6	U
Ethylbenzene	8260A		10.28.97	1	ug/kg	5.6	U
Methyl ethyl ketone	8260A		10.28.97	1	ug/kg	56	U
Methyl isobutyl ketone	8260A		10.28.97	1	ug/kg	56	U
Methyl-tert-butylether	8260A		10.28.97	1	ug/kg	11	U

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## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 13

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*5      18609-717      10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Volatiles

Methylene chloride	8260A		10.28.97	1	ug/kg	5.6	U
Styrene	8260A		10.28.97	1	ug/kg	5.6	U
Trichloroethene	8260A		10.28.97	1	ug/kg	5.6	U
Toluene	8260A		10.28.97	1	ug/kg	5.6	U
Tetrachloroethene	8260A		10.28.97	1	ug/kg	5.6	U
Vinyl acetate	8260A		10.28.97	1	ug/kg	11	U
Vinyl chloride	8260A		10.28.97	1	ug/kg	5.6	U
Total Xylene Isomers	8260A		10.28.97	1	ug/kg	17	U
cis-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	5.6	U
cis-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	5.6	U
trans-1,2-Dichloroethene	8260A		10.28.97	1	ug/kg	5.6	U
trans-1,3-Dichloropropene	8260A		10.28.97	1	ug/kg	5.6	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		10.28.97	1	Percent	72	
4-Bromofluorobenzene Rep.	8260A		10.28.97	1	Percent	102	
Toluene-d8 Reported	8260A		10.28.97	1	Percent	98	
Dibromofluoromethane Rep.	8260A		10.28.97	1	Percent	88	

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED	
9710430*5		18609-717					10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG	
(Following results reported on the basis of 11.0% moisture)								
Compounds by SIM								
Benzo(a)pyrene	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
Dibenzo(a,h)anthracene	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
-Nitrosodi-n-propylamine	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
is(2-chloroethyl)ether	8270.S	10.23.97	10.28.97	1	ug/kg	37	U	
Surrogates **								
2-Fluorobiphenyl Reported	8270.S	10.23.97	10.28.97	1	Percent	56		
Terphenyl-d14 Reported	8270.S	10.23.97	10.28.97	1	Percent	58		

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 4

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
9710430*5 18609-717						10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
(Following results reported on the basis of 11.0% moisture)							
Semi-volatiles							
1,2,4-Trichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,2-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,3-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
1,4-Dichlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4,5-Trichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4,6-Trichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dichlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dimethylphenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,4-Dinitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	930	U
2,4-Dinitrotoluene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2,6-Dinitrotoluene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Chloronaphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Chlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Methyl-4,6-dinitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	930	U
2-Methylnaphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Methylphenol (o-Cresol)	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Nitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
3,3'-Dichlorobenzidine	8270B	10.23.97	10.28.97	1	ug/kg	370	U
3-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Bromophenylphenylether	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chloro-3-methylphenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chloroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Chlorophenylphenylether	8270B	10.23.97	10.28.97	1	ug/kg	370	U

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SAMPLE NO: 9710430\*5

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2031 Main Street  
Irvine, CA 92614

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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 5

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*5 18609-717 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Semi-volatiles

4-Methylphenol (p-Cresol)	8270B	10.23.97	10.28.97	1	ug/kg	370	U
4-Nitroaniline	8270B	10.23.97	10.28.97	1	ug/kg	370	U
2-Nitrophenol	8270B	10.23.97	10.28.97	1	ug/kg	930	U
Acenaphthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Acenaphthylene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Anthracene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(a)anthracene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(b)fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(g,h,i)perylene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Benzo(k)fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Butylbenzylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Chrysene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Di-n-octylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dibenzofuran	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dibutylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Diethylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Dimethylphthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Fluoranthene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Fluorene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorobutadiene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachlorocyclopentadiene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Hexachloroethane	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Indeno(1,2,3-c,d)pyrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U

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SAMPLE NO: 9710430\*5

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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 6

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*5 18609-717 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Semi-volatiles

N-Nitrosodiphenylamine	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Nitrobenzene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Naphthalene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Phenanthrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Phenol	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Pentachlorophenol	8270B	10.23.97	10.28.97	1	ug/kg	740	U
Pyrene	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-chloroethoxy)methane	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-chloroisopropyl)ether	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Bis(2-ethylhexyl)phthalate	8270B	10.23.97	10.28.97	1	ug/kg	370	U
Surrogates **							
2-Fluorobiphenyl Reported	8270B	10.23.97	10.28.97	1	Percent	105	
2-Fluorophenol Reported	8270B	10.23.97	10.28.97	1	Percent	89	
2,4,6-Tribromophenol Rep.	8270B	10.23.97	10.28.97	1	Percent	106	
Nitrobenzene-d5 Reported	8270B	10.23.97	10.28.97	1	Percent	100	
Phenol-d5 Reported	8270B	10.23.97	10.28.97	1	Percent	100	
Terphenyl-d14 Reported	8270B	10.23.97	10.28.97	1	Percent	90	



000054A

SAMPLE NO: 9710430\*5

Received: 10.22.97

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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 7

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE		DATE SAMPLED
9710430*5	18609-717	10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Pesticides

Aldrin	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
,p'-DDD	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
p,p'-DDE	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
p,p'-DDT	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Dieldrin	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endosulfan I	8081	10.24.97	10.29.97	1	ug/kg	0.79	U
Endosulfan II	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endosulfan sulfate	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endrin	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endrin aldehyde	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Endrin Ketone	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Heptachlor epoxide	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Heptachlor	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Methoxychlor	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Toxaphene	8081	10.24.97	10.29.97	1	ug/kg	190	U
BHC, alpha isomer	8081	10.24.97	10.29.97	1	ug/kg	0.79	U
alpha-Chlordane	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
BHC, beta isomer	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
BHC, delta isomer	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
BHC, gamma isomer (Lindane)	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
gamma-Chlordane	8081	10.24.97	10.29.97	1	ug/kg	2.2	U
Surrogates **							

000054B

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Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 8

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430*5	18609-717							10.21.97
-----------	-----------	--	--	--	--	--	--	----------

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Pesticides

Decachlorobiphenyl Reported	8081	10.24.97	10.29.97	1	Percent	108
Tetrachloro-meta-xylene Rpt	8081	10.24.97	10.29.97	1	Percent	79

000056

SAMPLE NO: 9710430\*5

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 9

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*5 18609-717 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

## Polychlorinated Biphenyls

Aroclor 1016	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1221	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1232	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1242	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1248	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1254	8081	10.24.97	10.29.97	1	ug/kg	37	U
Aroclor 1260	8081	10.24.97	10.29.97	1	ug/kg	37	U
Surrogates **							
Decachlorobiphenyl Reported	8081	10.24.97	10.29.97	1	Percent	108	
Tetrachloro-meta-xylene Rpt	8081	10.24.97	10.29.97	1	Percent	79	

## ANALYTICAL REPORT

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SAMPLE NO: 9710430\*5

Received: 10.22.97

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Ms. Mary Schneider  
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2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9710430*5	18609-717						10.21.97
-----							-----
PARAMETER	METHOD	PREP	ANALYZED	DIL	UNITS	RESULT	FLG
-----							-----
(Following results reported on the basis of 11.0% moisture)							
Total Cyanide	9010A	10.24.97	10.24.97	1	mg/kg	0.56	U
pH	9045		10.24.97	1	Units	8.2	
-Moisture/TNFR	D2216		10.24.97	1	Percent	11	
Aluminum	6010A	10.27.97	10.28.97	1	mg/kg	9700	
Antimony	6010A	10.27.97	10.28.97	1	mg/kg	5.6	U
Arsenic	7060A	10.27.97	10.28.97	1	mg/kg	2.0	
Barium	6010A	10.27.97	10.28.97	1	mg/kg	150	
Beryllium	6010A	10.27.97	10.28.97	1	mg/kg	0.48	
Cadmium	6010A	10.27.97	10.28.97	1	mg/kg	0.56	U
Calcium	6010A	10.27.97	10.28.97	1	mg/kg	7100	
Chromium	6010A	10.27.97	10.28.97	1	mg/kg	9.4	
Cobalt	6010A	10.27.97	10.28.97	1	mg/kg	5.8	
Copper	6010A	10.27.97	10.28.97	1	mg/kg	6.3	
Iron	6010A	10.27.97	10.28.97	5	mg/kg	16000	
Lead	7421	10.27.97	10.28.97	1	mg/kg	1.8	
Magnesium	6010A	10.27.97	10.28.97	1	mg/kg	6200	
Manganese	6010A	10.27.97	10.28.97	1	mg/kg	220	
Mercury	7471A	10.24.97	10.27.97	1	mg/kg	0.09	U
Molybdenum	6010A	10.27.97	10.28.97	1	mg/kg	2.2	U
Nickel	6010A	10.27.97	10.28.97	1	mg/kg	6.1	
Potassium	6010A	10.27.97	10.28.97	1	mg/kg	3700	
Selenium	7740	10.27.97	10.28.97	1	mg/kg	0.56	U
Silver	6010A	10.27.97	10.28.97	1	mg/kg	1.1	U
Sodium	6010A	10.27.97	10.28.97	1	mg/kg	220	
-----							-----

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SAMPLE NO: 9710430\*5

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2031 Main Street  
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P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

## SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE

DATE SAMPLED

9710430\*5 18609-717 10.21.97

PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----------	--------	--------	----------	-----	-------	--------	-----

(Following results reported on the basis of 11.0% moisture)

Thallium	6010A	10.27.97	10.28.97	1	mg/kg	4.5	J
Vanadium	6010A	10.27.97	10.28.97	1	mg/kg	30	
	6010A	10.27.97	10.28.97	1	mg/kg	47	
stion	3050	10.27.97	10.27.97	1	Date	10/27/97	
urnace Digestion	3050	10.27.97	10.27.97	1	Date	10/27/97	

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SAMPLE NO: 9710430\*15

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Req#: DO#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 2

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9710430*15	18609-718						10.21.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							-----
(Following results reported on the basis of 12.0% moisture)							
Volatiles							
1,1,1-Trichloroethane	8260A		10.29.97	1	ug/kg	5.7	U
1,1,2,2-Tetrachloroethane	8260A		10.29.97	1	ug/kg	5.7	U
1,1,2-Trichloroethane	8260A		10.29.97	1	ug/kg	5.7	U
1,1-Dichloroethane	8260A		10.29.97	1	ug/kg	5.7	U
1,1-Dichloroethene	8260A		10.29.97	1	ug/kg	5.7	U
1,2-Dichloroethane	8260A		10.29.97	1	ug/kg	5.7	U
1,2-Dichloropropane	8260A		10.29.97	1	ug/kg	5.7	U
2-Chloroethylvinylether	8260A		10.29.97	1	ug/kg	57	U
2-Hexanone	8260A		10.29.97	1	ug/kg	57	U
Acetone	8260A		10.29.97	1	ug/kg	57	U
Bromodichloromethane	8260A		10.29.97	1	ug/kg	5.7	U
Bromomethane	8260A		10.29.97	1	ug/kg	5.7	U
Benzene	8260A		10.29.97	1	ug/kg	5.7	U
Bromoform	8260A		10.29.97	1	ug/kg	5.7	U
Chlorobenzene	8260A		10.29.97	1	ug/kg	5.7	U
Carbon Tetrachloride	8260A		10.29.97	1	ug/kg	5.7	U
Chloroethane	8260A		10.29.97	1	ug/kg	5.7	U
Chloroform	8260A		10.29.97	1	ug/kg	5.7	U
Chloromethane	8260A		10.29.97	1	ug/kg	5.7	U
Carbon Disulfide	8260A		10.29.97	1	ug/kg	5.7	U
Dibromochloromethane	8260A		10.29.97	1	ug/kg	5.7	U
Ethylbenzene	8260A		10.29.97	1	ug/kg	5.7	U
Methyl ethyl ketone	8260A		10.29.97	1	ug/kg	57	U
Methyl isobutyl ketone	8260A		10.29.97	1	ug/kg	57	U
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000150

SAMPLE NO: 9710430\*15

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Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 3

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE							DATE SAMPLED
-----							-----
9710430*15	18609-718						10.21.97
-----							-----
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT	FLG
-----							-----
(Following results reported on the basis of 12.0% moisture)							
Volatiles							
Methyl-tert-butylether	8260A		10.29.97	1	ug/kg	11	U
Methylene chloride	8260A		10.29.97	1	ug/kg	5.7	U
Styrene	8260A		10.29.97	1	ug/kg	5.7	U
Trichloroethene	8260A		10.29.97	1	ug/kg	5.7	U
Toluene	8260A		10.29.97	1	ug/kg	5.7	U
Tetrachloroethene	8260A		10.29.97	1	ug/kg	5.7	U
Vinyl acetate	8260A		10.29.97	1	ug/kg	11	U
Vinyl chloride	8260A		10.29.97	1	ug/kg	5.7	U
Total Xylene Isomers	8260A		10.29.97	1	ug/kg	17	U
cis-1,2-Dichloroethene	8260A		10.29.97	1	ug/kg	5.7	U
cis-1,3-Dichloropropene	8260A		10.29.97	1	ug/kg	5.7	U
trans-1,2-Dichloroethene	8260A		10.29.97	1	ug/kg	5.7	U
trans-1,3-Dichloropropene	8260A		10.29.97	1	ug/kg	5.7	U
Surrogates **							
1,2-Dichloroethane-d4 Rep.	8260A		10.29.97	1	Percent	68	
4-Bromofluorobenzene Rep.	8260A		10.29.97	1	Percent	106	
Toluene-d8 Reported	8260A		10.29.97	1	Percent	100	
Dibromofluoromethane Rep.	8260A		10.29.97	1	Percent	86	
-----							-----

# ANALYTICAL REPORT

000148

SAMPLE NO: 9710430\*15

Received: 10.22.97

Mailed:

Ms. Mary Schneider  
OHM Remediation Services Corp.  
2031 Main Street  
Irvine, CA 92614

P.O.#: 1040171  
Req#: D0#0070  
Project: 18609-002

## DRY WEIGHT REPORT OF ANALYTICAL RESULTS

Page 1

SAMPLE DESCRIPTION, NON-AQUEOUS SAMPLE						DATE SAMPLED	
9710430*15	18609-718					10.21.97	
PARAMETER	METHOD	PREPED	ANALYZED	DIL	UNITS	RESULT FLG	
(Following results reported on the basis of 12.0% moisture)							
-Moisture/TNFR	D2216		10.30.97	1	Percent	12	



***Appendix J***  
***LDC Data Validation Report***

**Laboratory Data Consultants, Inc.**  
**Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** October 21, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Soil  
**Parameters:** Total Petroleum Hydrocarbons as Gasoline  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.  
**Sample Delivery Group (SDG):** G9710430

**Sample Identification**

18609-709  
18609-711  
18609-713  
18609-715  
18609-717  
18609-719  
18609-721  
18609-723  
18609-725  
18609-727  
18609-715MS  
18609-715MSD  
18609-719MS  
18609-719MSD  
18609-727MS  
18609-727MSD

## Introduction

This data review covers 16 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. Calibration**

### **a. Initial Calibration**

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination ( $r^2$ ) was greater than or equal to 0.990 .

### **b. Calibration Verification**

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

## **IV. Accuracy and Precision Data**

### **a. Surrogate Recovery**

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

### **b. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

### **c. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **V. Target Compound Identification**

Raw data were not reviewed for this SDG.

## **VI. Compound Quantitation and CRQLs**

Raw data were not reviewed for this SDG.

## **VII. System Performance**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags have been summarized at the end of this report.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

No field blanks were identified in this SDG.

**MCAS EI Toro**

**Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG G9710430**

No Sample Data Qualified in this SDG

**MCAS EI Toro**

**Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG G9710430**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** October 21, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Soil/Water  
**Parameters:** Total Petroleum Hydrocarbons as Extractables  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.  
**Sample Delivery Group (SDG):** G9710430

**Sample Identification**

18609-709  
18609-711  
18609-713  
18609-715  
18609-717  
18609-719  
18609-721  
18609-723  
18609-725  
18609-727  
18609-730

## Introduction

This data review covers 10 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.



## I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## II. Calibration

### a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination ( $r^2$ ) was greater than or equal to 0.990.

### b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

## III. Blanks

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
Method Blank (1)	10/24/97	TPH as diesel	0.03 mg/L	All water samples in SDG G9710430

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
18609-730	TPH as diesel	0.078 mg/L	0.5U mg/L

## IV. Accuracy and Precision Data

### a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All

surrogate recoveries (%R) were within QC limits.

#### **b. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

#### **c. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

### **V. Target Compound Identification**

Raw data were not reviewed for this SDG.

### **VI. Compound Quantitation and CRQLs**

Raw data were not reviewed for this SDG.

### **VII. System Performance**

Raw data were not reviewed for this SDG.

### **VIII. Overall Assessment of Data**

Data flags have been summarized at the end of this report.

### **IX. Field Duplicates**

No field duplicates were identified in this SDG.

### **X. Field Blanks**

Sample 18609-730 was identified as a rinsate. No total petroleum hydrocarbons as extractable contaminants were found in this blank with the following exceptions:

Rinsate ID	Compound	Concentration (mg/L)
18609-730	TPH as diesel	0.078

**MCAS El Toro**

**Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG G9710430**

No Sample Data Qualified in this SDG

**MCAS El Toro**

**Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG G9710430**

SDG	Sample	Compound	Modified Final Concentration	A or P
G9710430	18609-730	TPH as diesel	0.5U mg/L	A

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** October 21, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Soil  
**Parameters:** Volatiles  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.

**Sample Delivery Group (SDG):** G9710430

**Sample Identification**

18609-709  
18609-710  
18609-711  
18609-712  
18609-713  
18609-714  
18609-715  
18609-716  
18609-717  
18609-718  
18609-719  
18609-720  
18609-721  
18609-722  
18609-723  
18609-724  
18609-725  
18609-726  
18609-727  
18609-728  
18609-722MS  
18609-722MSD

## Introduction

This data review covers 22 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260A for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## II. GC/MS Instrument Performance Check

The samples were analyzed after the BFB tuning. The instrument performance check could not be verified at the 12 hour interval.

All ion abundance requirements were met.

## III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

Average relative response factors (RRF) for all volatile target compounds and system monitoring compounds were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/22/97	Acetone Vinyl acetate	0.032 ( $\geq 0.05$ ) 0.030 ( $\geq 0.05$ )	All samples in SDG G9710430	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds with the following exceptions:

Date	Compound	%D (Limits)	Associated Samples	Flag	A or P
10/27/97	2-Hexanone	56.9 ( $\leq 50$ )	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723 B7101738	J	A
10/28/97	2-Chloroethylvinyl ether Methyl isobutyl ketone 2-Hexanone	61.1 ( $\leq 50$ ) 57.5 ( $\leq 50$ ) 65.2 ( $\leq 50$ )	18609-710 18609-712 18609-714 18609-716 18609-718 18609-720 18609-722 18609-724 18609-725 18609-726 18609-727 18609-728 18609-722MS 18609-722MSD B7101846	J J J	A

All of the continuing calibration RRF values were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/27/97	Chloromethane	0.094 ( $\geq 0.10$ )	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723 B7101738	None	P
10/27/97	Acetone Vinyl acetate Methyl ethyl ketone Methyl isobutyl ketone	0.042 ( $\geq 0.05$ ) 0.021 ( $\geq 0.05$ ) 0.026 ( $\geq 0.05$ ) 0.044 ( $\geq 0.05$ )	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723 B7101738	J (all detects) R (all non-detects)	A

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
10/28/97	Acetone Vinyl acetate Methyl ethyl ketone Methyl isobutyl ketone	0.017 ( $\geq 0.05$ ) 0.020 ( $\geq 0.05$ ) 0.020 ( $\geq 0.05$ ) 0.034 ( $\geq 0.05$ )	18609-710 18609-712 18609-714 18609-716 18609-720 18609-718 18609-722 18609-724 18609-725 18609-726 18609-727 18609-728 18609-722MS 18609-722MSD B7101846	J (all detects) R (all non-detects)	A

## V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
B7101738	10/27/97	Acetone Methyl ethyl ketone Methyl-tert-butyl ether	16 ug/Kg 1.8 ug/Kg 1.5 ug/Kg	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723
B7101846	10/28/97	Acetone	8.5 ug/Kg	18609-710 18609-712 18609-714 18609-716 18609-718 18609-720 18609-722 18609-724 18609-725 18609-726 18609-727 18609-728

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater ( $>10X$  for common contaminants,  $>5X$  for other contaminants) than the concentrations found in the associated method blanks.



## VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

## VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
18609-722MS/MSD (All samples in SDG G9710430)	Trichloroethene	-	142 (61-135)	-	J (all detects)	A

## VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## IX. Regional Quality Assurance and Quality Control

Not applicable.

## X. Internal Standards

All internal standard areas and retention times were within QC limits.

## XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

## XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

## XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

## XIV. System Performance

Raw data were not reviewed for this SDG.

#### **XV. Overall Assessment of Data**

Data flags have been summarized at the end of the report.

#### **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

#### **XVII. Field Blanks**

No field blanks were identified in this SDG.

MCAS EI Toro  
Volatiles - Data Qualification Summary - SDG G9710430

SDG	Sample	Compound	Flag	A or P	Reason
G9710430	18609-709	Acetone	J (all detects)	A	Initial calibration (RRF)
	18609-710		R (all non-detects)		
	18609-711	Vinyl acetate	J (all detects)		
	18609-712		R (all non-detects)		
	18609-713				
	18609-714				
	18609-715				
	18609-716				
	18609-717				
	18609-718				
	18609-719				
	18609-720				
	18609-721				
	18609-722				
	18609-723				
	18609-724				
	18609-725				
	18609-726				
	18609-727				
	18609-728				
G9710430	18609-709	2-Hexanone	J	A	Continuing calibration (%D)
	18609-711				
	18609-713				
	18609-715				
	18609-717				
	18609-719				
	18609-721				
	18609-723				
G9710430	18609-710	2-Chloroethylvinyl ether	J	A	Continuing calibration (%D)
	18609-712	Methyl isobutyl ketone	J		
	18609-714	2-Hexanone	J		
	18609-716				
	18609-718				
	18609-720				
	18609-722				
	18609-724				
	18609-725				
	18609-726				
	18609-727				
	18609-728				
G9710430	18609-709	Chloromethane	None	P	Continuing calibration (RRF)
	18609-711				
	18609-713				
	18609-715				
	18609-717				
	18609-719				
	18609-721				
	18609-723				

SDG	Sample	Compound	Flag	A or P	Reason
G9710430	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723	Acetone Vinyl acetate Methyl ethyl ketone Methyl isobutyl ketone	J (all detects) R (all non-detects)	A	Continuing calibration (RRF)
G9710430	18609-710 18609-712 18609-714 18609-716 18609-718 18609-720 18609-722 18609-724 18609-725 18609-726 18609-727 18609-728	Acetone Vinyl acetate Methyl ethyl ketone Methyl isobutyl ketone	J (all detects) R (all non-detects)	A	Continuing calibration (RRF)
G9710430	18609-709 18609-710 18609-711 18609-712 18609-713 18609-714 18609-715 18609-716 18609-717 18609-718 18609-719 18609-720 18609-721 18609-722 18609-723 18609-724 18609-725 18609-726 18609-727 18609-728	Trichloroethene	J (all detects)	A	Matrix spike/Matrix spike duplicates (%R)

**MCAS El Toro**

**Volatiles - Laboratory Blank Data Qualification Summary - SDG G9710430**

**No Sample Data Qualified in this SDG**

**Laboratory Data Consultants, Inc.**  
**Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** October 21, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Soil/Water  
**Parameters:** Semivolatiles  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.

**Sample Delivery Group (SDG):** G9710430

**Sample Identification**

18609-709  
18609-710  
18609-711  
18609-713  
18609-715  
18609-717  
18609-719  
18609-721  
18609-723  
18609-725  
18609-727  
18609-730

## Introduction

This data review covers 11 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270B for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. GC/MS Instrument Performance Check**

The samples were analyzed after the DFTPP tuning. The instrument performance check could not be verified at the 12 hour interval.

All ion abundance requirements were met.

## **III. Initial Calibration**

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

Average relative response factors (RRF) for all semivolatile target compounds and system monitoring compounds were greater than or equal to 0.05 as required.

## **IV. Continuing Calibration**

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 20.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

All of the continuing calibration RRF values were greater than or equal to 0.05 .

## **V. Blanks**

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
B7101740	10/23/97	Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	4.9 ug/L 1.8 ug/L	All water samples in SDG G9710430

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
B7101401	10/23/97	Di-n-butylphthalate Bis(2-ethylhexyl)phthalate	110 ug/Kg 32 ug/Kg	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723 18609-725 18609-727

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
18609-730	Di-n-butylphthalate	15 ug/L	15U ug/L
18609-711	Bis(2-ethylhexyl)phthalate	120 ug/Kg	370U ug/Kg

## VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

## VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
9710422*17 (All soil samples in SDG G9710430)	Pentachlorophenol	-	-	38 (≤30)	J	A

## VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:



LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
C7103350/3351 (All water samples in SDG G9710430)	4-Chloroaniline 4-Nitroaniline	160 (46-126) 197 (40-166)	160 (46-126) 197 (40-166)	- -	J (all detects) J (all detects)	A

## IX. Regional Quality Assurance and Quality Control

Not applicable.

## X. Internal Standards

All internal standard areas and retention times were within QC limits.

## XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

## XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

## XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

## XIV. System Performance

Raw data were not reviewed for this SDG.

## XV. Overall Assessment

Data flags have been summarized at the end of the report.

## XVI. Field Duplicates

No field duplicates were identified in this SDG.

## XVII. Field Blanks

Sample 18609-730 was identified as a rinsate. No semivolatile contaminants were found in this blank with the following exceptions:

Rinsate ID	Compound	Concentration (ug/L)
18609-730	Di-n-butylphthalate	15

**MCAS EI Toro**  
**Semivolatiles - Data Qualification Summary - SDG G9710430**

SDG	Sample	Compound	Flag	A or P	Reason
G9710430	18609-709 18609-710 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723 18609-725 18609-727	Pentachlorophenol	J	A	Matrix spike/Matrix spike duplicates (%R)(RPD)
G9710430	18609-730	4-Chloroaniline 4-Nitroaniline	J (all detects) J (all detects)	A	Laboratory control samples (%R)(RPD)

**MCAS EI Toro**  
**Semivolatiles - Laboratory Blank Data Qualification Summary - SDG G9710430**

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
G9710430	18609-730	Di-n-butylphthalate	15U ug/L	A
G9710430	18609-711	Bis(2-ethylhexyl)phthalate	370U ug/Kg	A

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** October 21, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Soil  
**Parameters:** Semivolatiles  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.  
**Sample Delivery Group (SDG):** G9710430

**Sample Identification**

18609-709  
18609-710  
18609-711  
18609-713  
18609-715  
18609-717  
18609-719  
18609-721  
18609-723  
18609-725  
18609-727

## Introduction

This data review covers 11 soil samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270 using Selected Ion Monitoring (SIM) for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. GC/MS Instrument Performance Check**

The samples were analyzed after the DFTPP tuning. The instrument performance check could not be verified at the 12 hour interval.

All ion abundance requirements were met.

## **III. Initial Calibration**

Initial calibration was performed using required standard concentrations.

Calibration check compound data were not provided and therefore not reviewed.

Percent relative standard deviations (%RSD) were less than or equal to 50.0% for all other compounds.

Average relative response factors (RRF) for all semivolatile target compounds and system monitoring compounds were greater than or equal to 0.05 as required.

## **IV. Continuing Calibration**

Continuing calibration was performed at the required frequencies.

Calibration check compound data were not provided and therefore not reviewed.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 50.0% for all compounds.

All of the continuing calibration RRF values were greater than or equal to 0.05 .

## **V. Blanks**

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

## **VI. Surrogate Spikes**

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

## VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
C712275/12276 (18609-709 B712153)	Pentachlorophenol	-	-	35 (≤30)	J	A

## IX. Regional Quality Assurance and Quality Control

Not applicable.

## X. Internal Standards

Internal standards data were not provided and therefore not reviewed.

## XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

## XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

## XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

## XIV. System Performance

Raw data were not reviewed for this SDG.

## XV. Overall Assessment

Data flags have been summarized at the end of the report.

#### **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

#### **XVII. Field Blanks**

No field blanks were identified in this SDG.



**MCAS El Toro**  
**Semivolatiles - Data Qualification Summary - SDG G9710430**

SDG	Sample	Compound	Flag	A or P	Reason
G9710430	18609-709	Pentachlorophenol	J	A	Laboratory control samples (RPD)

**MCAS El Toro**  
**Semivolatiles - Laboratory Blank Data Qualification Summary - SDG G9710430**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** October 21, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Soil/Water  
**Parameters:** Chlorinated Pesticides & PCBs  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.

**Sample Delivery Group (SDG):** G9710430

**Sample Identification**

18609-709  
18609-711  
18609-713  
18609-715  
18609-717  
18609-719  
18609-721  
18609-723  
18609-725  
18609-727  
18609-730  
18609-709MS  
18609-709MSD

## Introduction

This data review covers 12 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081 for Chlorinated Pesticides and PCBs.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## II. GC/ECD Instrument Performance Check

Performance evaluation mixtures (PEM) data were not provided and therefore not reviewed.

## III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination ( $r^2$ ) was greater than or equal to 0.990 with the following exceptions:

Date	Column	Compound	$r^2$	Associated Samples	Flag	A or P
11/2/97	DB-608	Aroclor-1016	0.9566	All samples in SDG G9710430	J	P

Percent differences (%D) were less than or equal to 15.0% for selected compounds with the following exceptions:

Date	Column	Compound	%D	Associated Samples	Flag	A or P
10/22/97	DB-5	alpha-BHC	18.6	All samples in SDG G9710430	J	P
		Gamma-BHC	18.6		J	
		delta-BHC	16.5		J	

## IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
10/28/97 (08:38)	CCV	DB-608	alpha-BHC	16	Method Blank (1)	J	P
10/28/97 (21:30)	CCV	DB-608	alpha-BHC	17	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723 18609-725 18609-727	J	P
10/29/97 (06:55)	CCV	DB-608	alpha-BHC	20	18609-709MS 18609-709MSD	J	P
10/29/97 (18:51)	CCV	DB-5	Aroclor-1016	18.7	18609-709MS 18609-709MSD	J	P
10/29/97 (21:04)	CCV	DB-608	alpha-BHC 4,4'-DDT Methoxychlor	20 17 18	18609-709MS 18609-709MSD	J J J	P
10/29/97 (21:04)	CCV	DB-5	4,4'-DDT Methoxychlor	25 21	18609-709MS 18609-709MSD	J J	P
10/30/97 (05:56)	CCV	DB-608	Aroclor-1016	19.9	All water samples in SDG G9710430	J	P
10/30/97 (05:56)	CCV	DB-5	Aroclor-1016	15.3	All water samples in SDG G9710430	J	P
10/30/97 (12:37)	CCV	DB-608	Endrin aldehyde	24	All water samples in SDG G9710430	J	P
10/30/97 (12:37)	CCV	DB-5	Endosulfan sulfate	16	All water samples in SDG G9710430	J	P

The individual 4,4'-DDT and Endrin breakdowns were less than 20.0% .

## V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide or PCB contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
Method Blank (2)	10/24/97	Aldrin	0.0046 ug/L	18609-730
Method Blank (1)	10/24/97	Aldrin Endosulfan sulfate	0.14 ug/Kg 0.66 ug/Kg	All soil samples in SDG G9710430

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater ( >5X blank contaminants) than the concentrations found in the associated method blanks.

## VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

## VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LCS/LCSD (All water samples in SDG G9710430)	Aroclor-1260	-	-	33 (≤30)	J	A

## IX. Regional Quality Assurance and Quality Control

Not applicable.

## X. Pesticide Cleanup Checks

### a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

## **b. GPC Calibration**

GPC cleanup was not required and therefore not performed in this SDG.

## **XI. Target Compound Identification**

Raw data were not reviewed for this SDG.

## **XII. Compound Quantitation and Reported CRQLs**

Raw data were not reviewed for this SDG.

## **XIII. Overall Assessment of Data**

Data flags are summarized at the end of this report.

## **XIV. Field Duplicates**

No field duplicates were identified in this SDG.

## **XV. Field Blanks**

Sample 18609-730 was identified as a rinsate. No chlorinated pesticide or PCB contaminants were found in this blank with the following exceptions:

<b>Rinsate ID</b>	<b>Compound</b>	<b>Concentration (ug/L)</b>
18609-730	Endosulfan I	0.21
	Endosulfan II	0.31
	Endrin	0.11
	Endrin ketone	0.39
	alpha-BHC	0.21
	gamma-BHC	0.23

**MCAS El Toro**
**Chlorinated Pesticides & PCBs - Data Qualification Summary - SDG G9710430**

SDG	Sample	Compound	Flag	A or P	Reason
G9710430	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723 18609-725 18609-727 18609-730	Aroclor-1016	J	P	Initial calibration ( $r^2$ )
G9710430	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723 18609-725 18609-727 18609-730	alpha-BHC Gamma-BHC delta-BHC	J J J	P	Initial calibration (%D)
G9710430	18609-709 18609-711 18609-713 18609-715 18609-717 18609-719 18609-721 18609-723 18609-725 18609-727	alpha-BHC	J	P	Continuing calibration (%D)
G9710430	18609-730	Aroclor-1016 Endrin aldehyde Endosulfan sulfate	J J J	P	Continuing calibration (%D)
G9710430	18609-730	Aroclor-1260	J	A	Laboratory control samples (RPD)

**MCAS El Toro**
**Chlorinated Pesticides & PCBs - Laboratory Blank Data Qualification Summary - SDG G9710430**

No Sample Data Qualified in this SDG



**Laboratory Data Consultants, Inc.**  
**Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** October 21, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Soil/Water  
**Parameters:** Metals  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.  
**Sample Delivery Group (SDG):** G9710430

**Sample Identification**

18609-709  
18609-711  
18609-713  
18609-715  
18609-717  
18609-719  
18609-721  
18609-723  
18609-725  
18609-727  
18609-730  
18609-709MS  
18609-709MSD

## Introduction

This data review covers 12 soil samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

## III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found above the reporting limit in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Sodium	75 ug/L	All water samples in SDG G9710430

Sample concentrations were compared to concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater ( >5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
18609-730	Sodium	260 ug/L	260U ug/L

## IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

## V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each

matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
18609-722MS/MSD (All soil samples in SDG G9710430)	Aluminum	-	60 (75-125)	-	J	A
	Barium	135 (75-125)	-	-	J (all detects)	
	Calcium	133 (75-125)	667 (75-125)	116 ( $\leq 35$ )	J	
	Iron	152 (75-125)	45 (75-125)	46 ( $\leq 35$ )	J	
	Potassium	159 (75-125)	50 (75-125)	36 ( $\leq 35$ )	J	
	Manganese	122 (75-125)	141 (75-125)	-	J (all detects)	
	Antimony	55 (75-125)	60 (75-125)	-	J	
18609-722MS/MSD (All soil samples in SDG G9710430)	Selenium	23 (75-125)	36 (75-125)	42 ( $\leq 35$ )	J (all detects) R (all non-detects)	A

## VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

## VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

## IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption QC were not reviewed for this SDG.

## X. ICP Serial Dilution

Not required by the method.

## XI. Sample Result Verification

Raw data were not reviewed for this SDG.

## XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

## XIII. Field Duplicates

No field duplicates were identified in this SDG.

#### XIV. Field Blanks

Sample 18609-730 was identified as a rinsate. No metal contaminants were found in this blank with the following exceptions:

Rinsate ID	Analyte	Concentration (ug/L)
18609-730	Barium	1.0
	Calcium	180
	Copper	6.5
	Iron	22
	Magnesium	81
	Sodium	260
	Zinc	29

**MCAS El Toro**  
**Metals - Data Qualification Summary - SDG G9710430**

SDG	Sample	Analyte	Flag	A or P	Reason
G9710430	18609-709	Aluminum	J	A	Matrix spike analysis (%R)(RPD)
	18609-711	Barium	J (all detects)		
	18609-713	Calcium	J		
	18609-715	Iron	J		
	18609-717	Potassium	J		
	18609-719	Manganese	J (all detects)		
	18609-721	Antimony	J		
	18609-723				
	18609-725				
	18609-727				
G9710430	18609-709	Selenium	J (all detects)	A	Matrix spike analysis (%R)(RPD)
	18609-711		R (all non-detects)		
	18609-713				
	18609-715				
	18609-717				
	18609-719				
	18609-721				
	18609-723				
	18609-725				
	18609-727				

**MCAS El Toro**  
**Metals - Laboratory Blank Data Qualification Summary - SDG G9710430**

SDG	Sample	Analyte	Modified Final Concentration	A or P
G9710430	18609-730	Sodium	260U ug/L	A

**Laboratory Data Consultants, Inc.**  
**Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** October 21, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Soil/Water  
**Parameters:** Cyanide  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.  
**Sample Delivery Group (SDG):** G9710430

**Sample Identification**

18609-709  
18609-711  
18609-713  
18609-715  
18609-717  
18609-719  
18609-721  
18609-723  
18609-725  
18609-727  
18609-730

## Introduction

This data review covers 10 soil samples and one water sample listed on the cover sheet. The analyses were per EPA SW 846 Method 9010A for Cyanide.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.



## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No cyanide contaminants were found in the method blanks.

## **IV. Accuracy and Precision Data**

### **a. Matrix Spike/(Matrix Spike) Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

### **b. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

## **V. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VI. Overall Assessment of Data**

Data flags are summarized at the end of this report.

## **VII. Field Duplicates**

No field duplicates were identified in this SDG.

### **VIII. Field Blanks**

Sample 18609-730 was identified as a rinsate. No cyanide contaminants were found in this blank.

**MCAS El Toro  
Cyanide - Data Qualification Summary - SDG G9710430**

No Sample Data Qualified in this SDG

**MCAS El Toro  
Cyanide - Laboratory Blank Data Qualification Summary - SDG G9710430**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.**  
**Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** November 3, 1997  
**LDC Report Date:** June 10, 1998  
**Matrix:** Water  
**Parameters:** Total Petroleum Hydrocarbons as Gasoline  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.  
**Sample Delivery Group (SDG):** G9711012

**Sample Identification**

18609-753  
18609-754

## Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Gasoline.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. Calibration**

### **a. Initial Calibration**

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination ( $r^2$ ) was greater than or equal to 0.990 .

### **b. Calibration Verification**

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as gasoline contaminants were found in the method blanks.

## **IV. Accuracy and Precision Data**

### **a. Surrogate Recovery**

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

### **b. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

### **c. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

## **V. Target Compound Identification**

Raw data were not reviewed for this SDG.

## **VI. Compound Quantitation and CRQLs**

Raw data were not reviewed for this SDG.

## **VII. System Performance**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags have been summarized at the end of this report.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Sample 18609-753 was identified as a rinsate. No total petroleum hydrocarbons as gasoline contaminants were found in this blank.

Sample 18609-754 was identified as a trip blank. No total petroleum hydrocarbons as gasoline contaminants were found in this blank.

**MCAS El Toro**

**Total Petroleum Hydrocarbons as Gasoline - Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

**MCAS El Toro**

**Total Petroleum Hydrocarbons as Gasoline - Laboratory Blank Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG



**Laboratory Data Consultants, Inc.**  
**Data Validation Report**

**Project/Site Name:** MCAS El Toro

**Collection Date:** November 3, 1997

**LDC Report Date:** June 10, 1998

**Matrix:** Water

**Parameters:** Total Petroleum Hydrocarbons as Extractables

**Validation Level:** NFESC Level C

**Laboratory:** VOC Analytical Laboratories, Inc.

**Sample Delivery Group (SDG):** G9711012

**Sample Identification**  
18609-753

## Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8015 modified for Total Petroleum Hydrocarbons (TPH) as Extractables.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. Calibration**

### **a. Initial Calibration**

Initial calibration of compounds was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination ( $r^2$ ) was greater than or equal to 0.990.

### **b. Calibration Verification**

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No total petroleum hydrocarbons as extractable contaminants were found in the method blanks.

## **IV. Accuracy and Precision Data**

### **a. Surrogate Recovery**

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

### **b. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

### **c. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

## **V. Target Compound Identification**

Raw data were not reviewed for this SDG.

## **VI. Compound Quantitation and CRQLs**

Raw data were not reviewed for this SDG.

## **VII. System Performance**

Raw data were not reviewed for this SDG.

## **VIII. Overall Assessment of Data**

Data flags have been summarized at the end of this report.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Field Blanks**

Sample 18609-753 was identified as a rinsate. No total petroleum hydrocarbons as extractable contaminants were found in this blank.

**MCAS El Toro**

**Total Petroleum Hydrocarbons as Extractables - Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

**MCAS El Toro**

**Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** November 3, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.

**Sample Delivery Group (SDG):** G9711012

**Sample Identification**

18609-753  
18609-754

## Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260A for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## II. GC/MS Instrument Performance Check

The samples were analyzed after the BFB tuning. The instrument performance check could not be verified at the 12 hour interval.

All ion abundance requirements were met.

## III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

Average relative response factors (RRF) for all volatile target compounds and system monitoring compounds were within validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/5/97	Acetone Methyl ethyl ketone Methyl isobutyl ketone	0.040 ( $\geq 0.05$ ) 0.040 ( $\geq 0.05$ ) 0.023 ( $\geq 0.05$ )	All samples in SDG G9711012	J (all detects) R (all non-detects)	A

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

All of the continuing calibration RRF values were within validation criteria with the following exceptions:



Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/11/97	Methyl ethyl ketone Methyl isobutyl ketone	0.044 ( $\geq 0.05$ ) 0.029 ( $\geq 0.05$ )	All samples in SDG G9711012	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A

## V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
B711578	11/10/97	Methylene chloride Acetone Methyl-tert-butyl ether Toluene	0.77 ug/L 12 ug/L 0.43 ug/L 0.17 ug/L	All samples in SDG G9711012

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater ( $> 10X$  for common contaminants,  $> 5X$  for other contaminants) than the concentrations found in the associated method blanks.

## VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
B711578	Dibromofluoromethane	74 (75-125)	All TCL compounds	J	P

## VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

## VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

## **IX. Regional Quality Assurance and Quality Control**

Not applicable.

## **X. Internal Standards**

All internal standard areas and retention times were within QC limits.

## **XI. Target Compound Identifications**

Raw data were not reviewed for this SDG.

## **XII. Compound Quantitation and CRQLs**

Raw data were not reviewed for this SDG.

## **XIII. Tentatively Identified Compounds (TICs)**

Raw data were not reviewed for this SDG.

## **XIV. System Performance**

Raw data were not reviewed for this SDG.

## **XV. Overall Assessment of Data**

Data flags have been summarized at the end of the report.

## **XVI. Field Duplicates**

No field duplicates were identified in this SDG.

## **XVII. Field Blanks**

Sample 18609-753 was identified as a rinsate. No volatile contaminants were found in this blank with the following exceptions:

Rinsate ID	Compound	Concentration (ug/L)
18609-753	Bromodichloromethane	0.77
	Chloroform	0.74
	Dibromochloromethane	0.59

**MCAS El Toro**  
**Volatiles - Data Qualification Summary - SDG G9711012**

SDG	Sample	Compound	Flag	A or P	Reason
G9711012	18609-753 18609-754	Acetone Methyl ethyl ketone Methyl isobutyl ketone	J (all detects) R (all non-detects)	A	Initial calibration (RRF)
G9711012	18609-753 18609-754	Methyl ethyl ketone  Methyl isobutyl ketone	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A	Continuing calibration (RRF)

**MCAS El Toro**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** November 3, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Water  
**Parameters:** Semivolatiles  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.  
**Sample Delivery Group (SDG):** G9711012

**Sample Identification**

18609-753

## Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270B for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. GC/MS Instrument Performance Check**

The samples were analyzed after the DFTPP tuning. The instrument performance check could not be verified at the 12 hour interval.

All ion abundance requirements were met.

## **III. Initial Calibration**

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

Average relative response factors (RRF) for all semivolatile target compounds and system monitoring compounds were greater than or equal to 0.05 as required.

## **IV. Continuing Calibration**

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 20.0% for all calibration check compounds and less than or equal to 50.0% for all other compounds.

All of the continuing calibration RRF values were greater than or equal to 0.05 .

## **V. Blanks**

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

## **VI. Surrogate Spikes**

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

## **VII. Matrix Spike/Matrix Spike Duplicates**

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix

spike and matrix spike duplicate analyses were not performed for this SDG.

### VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
C711435/436 (All samples in SDG G9711012)	4-Nitrophenol	23 (25-141)	-	50 ( $\leq 30$ )	J	A

### IX. Regional Quality Assurance and Quality Control

Not applicable.

### X. Internal Standards

All internal standard areas and retention times were within QC limits.

### XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

### XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

### XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

### XIV. System Performance

Raw data were not reviewed for this SDG.

### XV. Overall Assessment

Data flags have been summarized at the end of the report.

### XVI. Field Duplicates

No field duplicates were identified in this SDG.

## XVII. Field Blanks

Sample 18609-753 was identified as a rinsate. No semivolatile contaminants were found in this blank with the following exceptions:

Rinsate ID	Compound	Concentration (ug/L)
18609-753	Bis(2-ethylhexyl)phthalate	7.10



**MCAS EI Toro**  
**Semivolatiles - Data Qualification Summary - SDG G9711012**

SDG	Sample	Compound	Flag	A or P	Reason
G9711012	18609-753	4-Nitrophenol	J	A	Laboratory control samples (%R)(RPD)

**MCAS EI Toro**  
**Semivolatiles - Laboratory Blank Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.**  
**Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** November 3, 1997  
**LDC Report Date:** June 11, 1998  
**Matrix:** Water  
**Parameters:** Chlorinated Pesticides & PCBs  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.

**Sample Delivery Group (SDG):** G9711012

**Sample Identification**

18609-753

## Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081 for Chlorinated Pesticides and PCBs.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## II. GC/ECD Instrument Performance Check

Performance evaluation mixtures (PEM) data were not provided and therefore not reviewed.

## III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination ( $r^2$ ) was greater than or equal to 0.990 with the following exceptions:

Date	Column	Compound	$r^2$	Associated Samples	Flag	A or P
11/8/97	DB-5	Endrin aldehyde	0.9891	All samples in SDG G9711012	J	P

Percent differences (%D) were less than or equal to 15.0% for selected compounds with the following exceptions:

Date	Column	Compound	%D	Associated Samples	Flag	A or P
11/11/97	DB-5	delta-BHC	16	All samples in SDG G9711012	J	P
		Dieldrin	20		J	
		Methoxychlor	16		J	

## IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
11/9/97	CCV	DB-5	Aroclor-1016 Aroclor-1260	15.4 27.3	All samples in SDG G9711012	J	P
11/9/97	CCV	DB-608	Aroclor-1260	21.5	All samples in SDG G9711012	J	P
11/9/97	CCV	DB-5	Endrin	16	All samples in SDG G9711012	J	P

The individual 4,4'-DDT and Endrin breakdowns were less than 20.0% .

## V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide or PCB contaminants were found in the method blanks.

## VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

## VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MS/MSD (All samples in SDG G9711012)	Endrin gamma-BHC	145 (33-144) 137 (63-130)	- -	- -	J (all detects) J (all detects)	A

## VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## IX. Regional Quality Assurance and Quality Control

Not applicable.

## **X. Pesticide Cleanup Checks**

### **a. Florisil Cartridge Check**

Florisil cleanup was not required and therefore not performed in this SDG.

### **b. GPC Calibration**

GPC cleanup was not required and therefore not performed in this SDG.

## **XI. Target Compound Identification**

Raw data were not reviewed for this SDG.

## **XII. Compound Quantitation and Reported CRQLs**

Raw data were not reviewed for this SDG.

## **XIII. Overall Assessment of Data**

Data flags are summarized at the end of this report.

## **XIV. Field Duplicates**

No field duplicates were identified in this SDG.

## **XV. Field Blanks**

Sample 18609-753 was identified as a rinsate. No chlorinated pesticide or PCB contaminants were found in this blank.

**MCAS El Toro**

**Chlorinated Pesticides & PCBs - Data Qualification Summary - SDG G9711012**

SDG	Sample	Compound	Flag	A or P	Reason
G9711012	18609-753	Endrin aldehyde	J	P	Initial calibration ( $r^2$ )
G9711012	18609-753	delta-BHC Dieldrin Methoxychlor	J J J	P	Initial calibration (%D)
G9711012	18609-753	Aroclor-1016 Aroclor-1260 Endrin	J J J	P	Continuing calibration (%D)
G9711012	18609-753	Endrin gamma-BHC	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicates (RPD)

**MCAS El Toro**

**Chlorinated Pesticides & PCBs - Laboratory Blank Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** November 3, 1997  
**LDC Report Date:** June 10, 1998  
**Matrix:** Water  
**Parameters:** Metals  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.

**Sample Delivery Group (SDG):** G9711012

**Sample Identification**

18609-753



## Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010 and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UU Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. Calibration**

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found above the reporting limit in the initial, continuing and preparation blanks.

## **IV. ICP Interference Check Sample (ICS) Analysis**

The frequency of analysis was met.

The criteria for analysis were met.

## **V. Matrix Spike Analysis**

Matrix spike (MS) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits of 75-125% .

## **VI. Duplicate Sample Analysis**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

## **VII. Laboratory Control Samples (LCS)**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VIII. Internal Standards (ICP-MS)**

ICP-MS was not utilized in this SDG.

## IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption QC were not reviewed for this SDG.

## X. ICP Serial Dilution

Not required by the method.

## XI. Sample Result Verification

Raw data were not reviewed for this SDG.

## XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

## XIII. Field Duplicates

No field duplicates were identified in this SDG.

## XIV. Field Blanks

Sample 18609-753 was identified as a rinsate. No metal contaminants were found in this blank with the following exceptions:

Rinsate ID	Analyte	Concentration (ug/L)
18609-753	Aluminum	99
	Arsenic	2.5
	Barium	87
	Cadmium	2.2
	Calcium	64000
	Chromium	6.1
	Copper	11
	Iron	530
	Magnesium	25000
	Manganese	17
	Potassium	4800
	Sodium	92000
	Thallium	26
	Zinc	23

**MCAS El Toro**

**Metals - Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

**MCAS El Toro**

**Metals - Laboratory Blank Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

**Laboratory Data Consultants, Inc.**  
**Data Validation Report**

**Project/Site Name:** MCAS El Toro  
**Collection Date:** November 3, 1997  
**LDC Report Date:** June 10, 1998  
**Matrix:** Water  
**Parameters:** Cyanide  
**Validation Level:** NFESC Level C  
**Laboratory:** VOC Analytical Laboratories, Inc.  
**Sample Delivery Group (SDG):** G9711012

**Sample Identification**

18609-753

## Introduction

This data review covers one water sample listed on the cover sheet. The analyses were per EPA SW 846 Method 9010A for Cyanide.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the method stated above.

A table summarizing all data qualification is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section VII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. Calibration**

### **a. Initial Calibration**

All criteria for the initial calibration were met.

### **b. Calibration verification**

Calibration verification frequency and analysis criteria were met.

## **III. Blanks**

Method blanks were reviewed for each matrix as applicable. No cyanide contaminants were found in the method blanks.

## **IV. Accuracy and Precision Data**

### **a. Matrix Spike/(Matrix Spike) Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

### **b. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **V. Sample Result Verification**

Raw data were not reviewed for this SDG.

## **VI. Overall Assessment of Data**

Data flags are summarized at the end of this report.

## **VII. Field Duplicates**

No field duplicates were identified in this SDG.

### **VIII. Field Blanks**

Sample 18609-753 was identified as a rinsate. No cyanide contaminants were found in this blank.



**MCAS El Toro**  
**Cyanide - Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

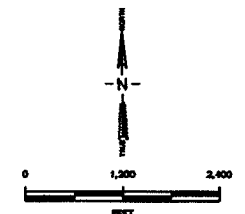
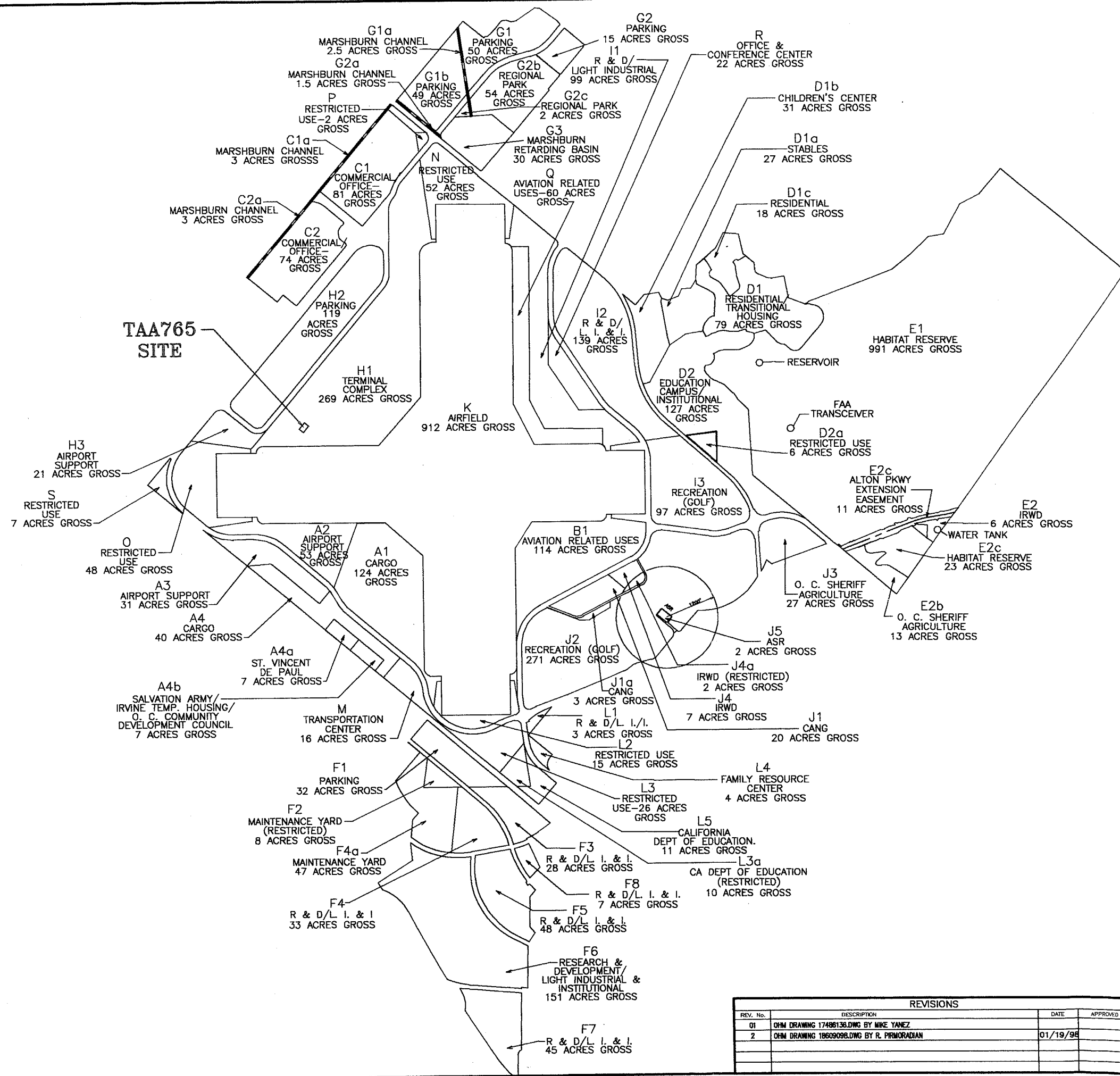
**MCAS El Toro**  
**Cyanide - Laboratory Blank Data Qualification Summary - SDG G9711012**

No Sample Data Qualified in this SDG

***Appendix K***

***Tentative Reuse Parcel Location of TAA 765***

G:\PROJECTS\18609\18609098.dwg  
Jun 23, 1998 - 1



REVISIONS			
REV. No.	DESCRIPTION	DATE	APPROVED
01	OHM DRAWING 17486138.DWG BY MIKE YANEZ		
2	OHM DRAWING 18609098.DWG BY R. PIRMORADIAN	01/19/98	

PROJECT		SWDIV		OHM Remediation Services Corp. A Subsidiary of OHM Corporation SAN DIEGO, CA	
DRAWN BY	DATE	EL TORO COMMUNITY REUSE PLAN			
R. PIRMORADIAN	06/23/98	1997 WORKING MAP LAND USES/			
CHECKED BY	DATE	CONVEYANCES GROSS ACRES			
DR	7/20/98	TAA 765 SITE			
APPROVED BY	DATE	MARINE CORPS AIR STATION			
JPM	7/20/98	EL TORO, CALIFORNIA			
PROJECT MANAGER	DATE				
AUTOCAD FILE No.		18609098.DWG			
SCALE	SHEET	OF	DOCUMENT CONTROL No.	OHM PROJECT No.	DRAWING No.
AS NOTED	1	1	N/A	18609	FIG 1